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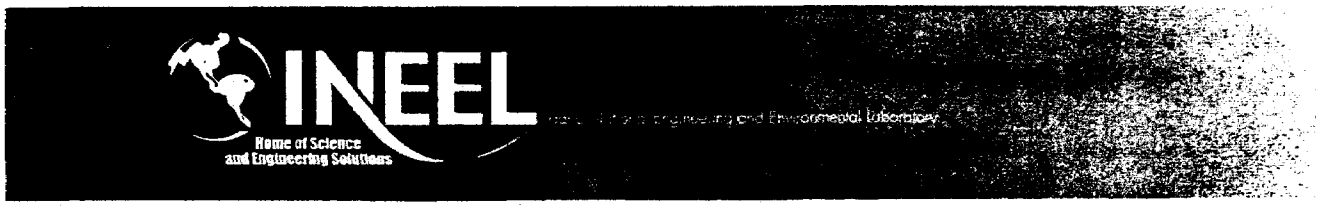
Removal Action Plan for the Accelerated Retrieval Project for a Described Area within Pit 4



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Prepared for the
U.S. Department of Energy
DOE Idaho Operations Office

ABSTRACT

This Removal Action Plan documents the plan for implementation of the Comprehensive Environmental Response, Compensation, and Liability Act non-time-critical removal action to be performed by the Accelerated Retrieval Project. The focus of the action is the limited excavation and retrieval of selected waste streams from a designated portion of the Radioactive Waste Management Complex Subsurface Disposal Area that are contaminated with volatile organic compounds, isotopes of uranium, or transuranic radionuclides. The selected retrieval area is approximately 0.2 ha (1/2 acre) and is located in the eastern portion of Pit 4. The waste in this area is primarily from the Rocky Flats Plant in Colorado. The area was selected by the U.S. Department of Energy, State of Idaho Department of Environmental Quality, and U.S. Environmental Protection Agency based on inventory evaluations identifying significant quantities of transuranic and other contaminated waste disposed of in the area. The proposed project is referred to as the Accelerated Retrieval Project. This Removal Action Plan details the major work elements, operations approach, and schedule, and summarizes the environmental, safety and health, and waste management considerations associated with the project.

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ACRONYMS

AK	acceptable knowledge
AR	Accelerated Retrieval
ARAR	applicable or relevant and appropriate requirement
CCP	Central Characterization Project
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DD&D	deactivation, decontamination, and decommissioning
DEQ	Idaho Department of Environmental Quality
DOE	U.S. Department of Energy
DOE Idaho	U.S. Department of Energy Idaho Operations Office
DOT	U.S. Department of Transportation
EDF	engineering design file
EE/CA	Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
EP/CP	Emergency Plan/Contingency Plan
FGE	fissile gram equivalent
HEPA	high-efficiency particulate air
HWD	hazardous waste determination
HWMA	Hazardous Waste Management Act
HWN	EPA Hazardous Waste Number
ICDF	INEEL CERCLA Disposal Facility
ICP	Idaho Completion Project
IDAPA	Idaho Administrative Procedures Act
INEEL	Idaho National Engineering and Environmental Laboratory
IW	industrial waste

IWTS	Integrated Waste Tracking System
LLW	low-level waste
MCP	management control procedure
MLLW	mixed low-level waste
MTRU	mixed transuranic
MW	mixed waste
NE-ID	Nuclear Energy, Science, and Technology Idaho Operations Office
NFPA	National Fire Protection Association
NTCRA	non-time-critical removal action
NTW	nontargeted waste
OU	operable unit
PCB	polychlorinated biphenyl
PCS	potentially contaminated soil
PPE	personal protective equipment
PVC	polyvinyl chloride
RadCon	radiological control
RAP	Removal Action Plan
RCT	radiological control technician
RE	Retrieval Enclosure
RFP	Rocky Flats Plant
ROD	Record of Decision
ROW	radioactive only waste
RWMC	Radioactive Waste Management Complex
SCW	special case waste
SDA	Subsurface Disposal Area
SE	Storage Enclosure

SLRA	screening level risk assessment
SWB	standard waste box
SWP	safe work permit
TBC	to-be-considered
TRU	transuranic
TRUPACT	transuranic package container
TSA	Transuranic Storage Area
TSCA	Toxic Substances Control Act
TSD	treatment, storage, and disposal
TW	targeted waste
UCL	upper confidence limit
UW	universal waste
VOC	volatile organic compound
WAC	waste acceptance criteria
WAG	waste area group
WGS	Waste Generator Services
WIPP	Waste Isolation Pilot Plant

DEFINITIONS

Acceptable knowledge. Acceptable knowledge includes information on the process generating the waste, waste packaging information, physical descriptions of the waste, radiological monitoring data, and other pertinent information gathered from records produced at the time the waste was generated or at a later time. The acceptable knowledge for the waste in Pit 4 was combined in a document entitled *Historical Background Report for Rocky Flats Plant Waste Shipped to the INEEL and Buried in the SDA from 1954 through 1971* (Abbott et al. 2004).

Area of Contamination. For the purpose of this non-time-critical removal action, the area of contamination encompasses the Subsurface Disposal Area as bounded by the flood control dike that surrounds the Subsurface Disposal Area perimeter.

Nontargeted Waste. The nontargeted waste includes debris, combustible waste, noncombustible waste, and Series 742 and 744 sludges that will remain in or are consolidated and relocated within the trench during the removal action.

Retrieved Waste. Waste that is removed from the designated area of Pit 4 during the Accelerated Retrieval Project.

Secondary Waste. A generic category for waste generated from support activities related to retrieving, processing, sampling, and packaging Accelerated Retrieval Project retrieved waste. Examples of secondary waste includes waste from decontamination activities, personal protective equipment from maintenance and operations, used equipment and sampling materials. Secondary waste is generated during all project phases.

Targeted Waste. The targeted waste in Pit 4 includes graphite, filters, Series 741 and 743 sludge, and uranium roaster oxide waste that is to be retrieved and removed from Pit 4 during the removal action.

Transuranic Radionuclides. Radionuclides with an atomic number greater than 92.

Transuranic Waste. Without regard to source or form, waste that is contaminated with alpha-emitting transuranic radionuclides (atomic number greater than 92) with half-lives greater than 20 years and concentrations greater than 100 nCi/g at the time of assay. Primary radionuclides associated with Subsurface Disposal Area Rocky Flats Plant transuranic waste are Pu-238, Pu-239, Pu-240, Pu-242, and Am-241.

Removal Action Plan for the Accelerated Retrieval Project for a Described Area within Pit 4

1. INTRODUCTION

This Removal Action Plan (RAP) documents the plan for implementation of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) non-time-critical removal action (NTCRA) to be performed by the Accelerated Retrieval (AR) Project. The NTCRA involves the limited excavation and retrieval of selected waste streams from a designated portion of the Subsurface Disposal Area (SDA) within the Radioactive Waste Management Complex (RWMC) at the Idaho National Engineering and Environmental Laboratory (INEEL) that are contaminated with volatile organic compounds (VOCs), isotopes of uranium, or transuranic (TRU) radionuclides. The approximate 0.2-ha (1/2-acre) designated portion is located within Pit 4. The INEEL RWMC location is illustrated in Figure 1. The designated retrieval area is shown in Figure 2. This area was selected by the U.S. Department of Energy (DOE), U.S. Environmental Protection Agency (EPA), and State of Idaho Department of Environmental Quality (DEQ) based on inventory evaluations, which identified significant quantities of TRU- contaminated Rocky Flats Plant (RFP) waste disposed of within the area. This RAP details the major work elements, operations approach, and schedule details, and summarizes the environmental and waste management considerations associated with the project.

This proposed NTCRA was described in the *Engineering Evaluation/Cost Analysis for the Accelerated Retrieval of a Designated Portion of Pit 4* (EE/CA) (Burton 2004a). The EE/CA was reviewed and commented on by the public. An *Action Memorandum for Accelerated Retrieval of a Described Area Within Pit* 4 (Burton 2004b) was prepared by the DOE Idaho Operations Office (DOE Idaho), and received the concurrence of the Region 10 EPA and the DEQ. The Action Memorandum provides additional detail (in comparison to the EE/CA) regarding the proposed removal action and documents EPA and DEQ concurrence with performance of the NTCRA. The proposed removal action, in addition to addressing a portion of the hazardous substances in the SDA, will provide characterization, technical, and cost information from full-scale waste retrieval activities that will support the Remedial Investigation/Feasibility Study for Operable Unit (OU) 7-13/14.

1.1 Background

This section provides general background information for the AR Project including a summary of the project objectives that were developed in the EE/CA.

1.1.1 Project Objectives

The AR Project implements a NTCRA under CERCLA Section 104 (42 USC § 9601 et seq., 1980). The removal alternative selected through the evaluation presented in the EE/CA will perform a targeted retrieval of certain RFP waste streams that are highly contaminated with TRU radionuclides, VOCs, and depleted uranium. To achieve this objective, the NTCRA will primarily focus on removal of the following RFP waste streams: Series 741 and 743 sludges, graphite, filters, and depleted uranium roaster oxide waste.

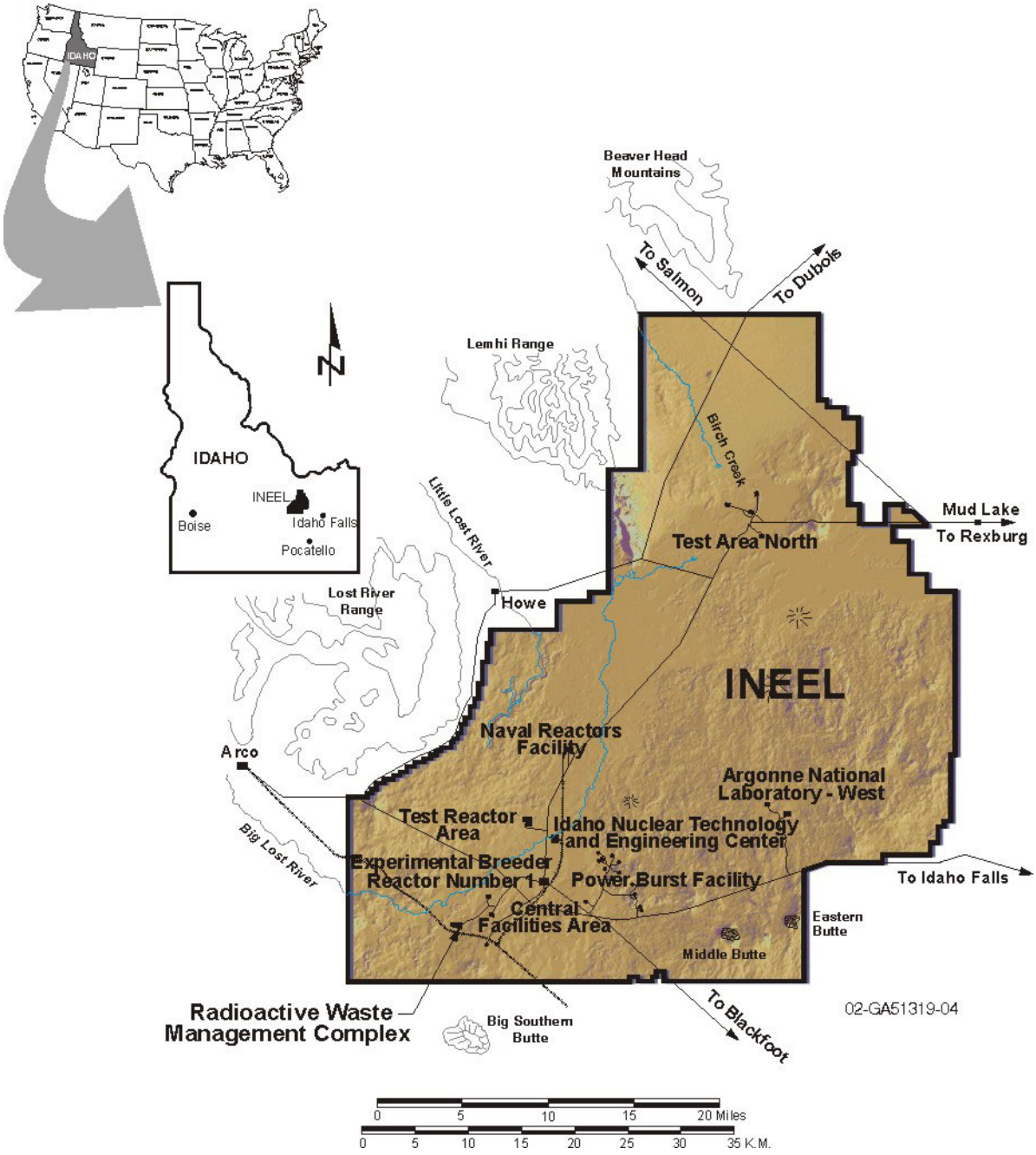


Figure 1. Location of the RWMC and other major facilities within the INEEL.

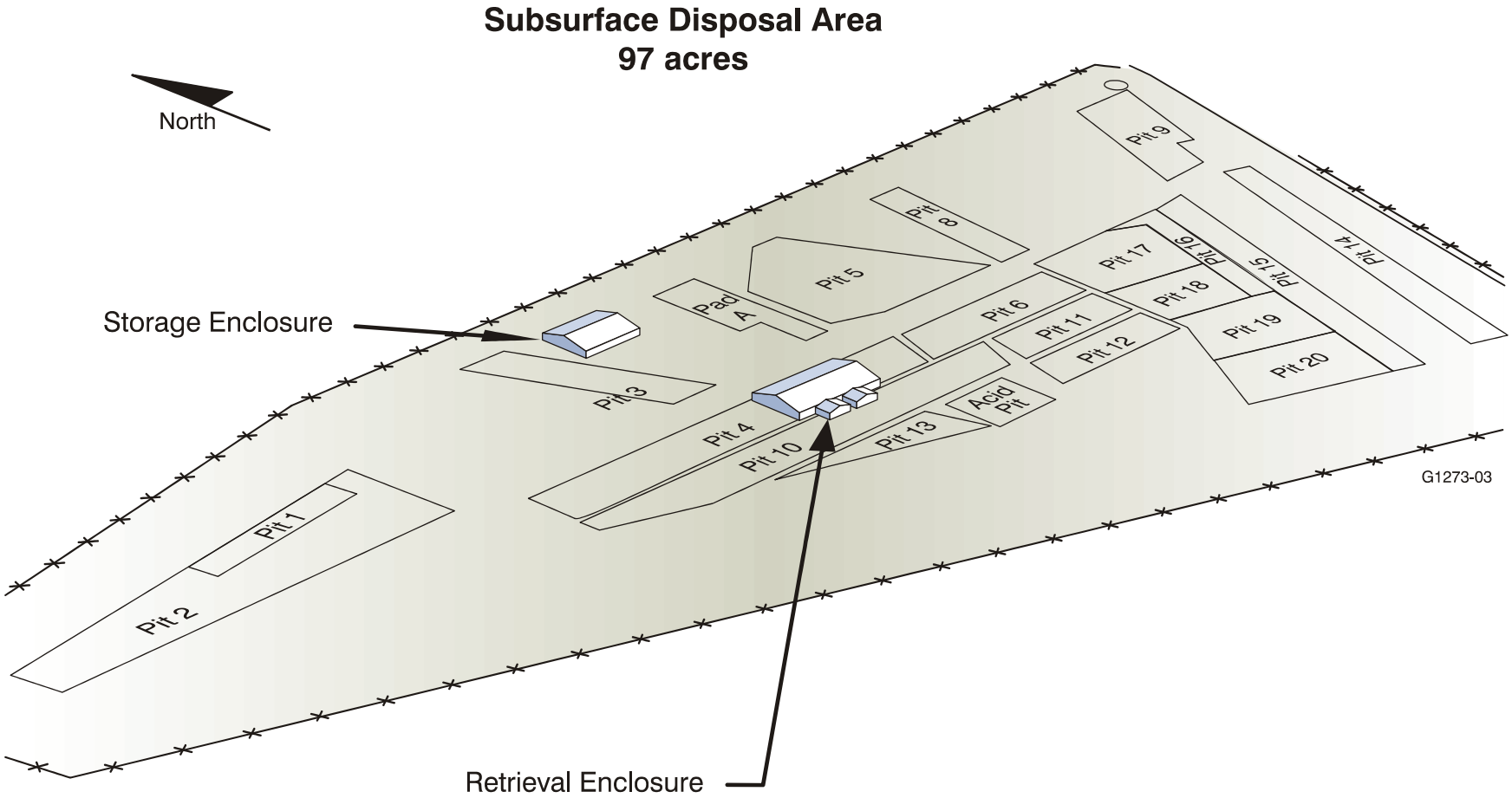


Figure 2. Pit 4 and the AR Project retrieval area in the SDA.

During the process of excavation, other waste will be revealed that is not within these targeted waste (TW) streams. This nontargeted waste (NTW) may also be removed on a case-by-case basis if the DOE remedial project manager, EPA, and DEQ waste area group (WAG) 7 remedial project managers agree that retrieval is warranted. This decision will be made if the information concerning the NTW that is available from visual inspection (such as package labeling or distinctive packaging) identifies the NTW as being of a nature that:

- Poses a potential risk of contamination to the underlying aquifer if left in place
- The potential risk is sufficient to warrant removal at that time rather than leaving it to be addressed by the OU 7-13/14 final remedial action for WAG 7
- The waste can be safely managed using the personnel, facilities, and equipment readily available onsite for retrieval of the waste.

1.1.2 Background of Pit 4 within the SDA

The SDA is a radioactive waste landfill with shallow subsurface disposal units consisting of pits, trenches, and soil vaults. The buried RFP TRU waste is located primarily in disposal Pits 1–6, Pits 9–12, and Trenches 1–10. Trenches 11–15 also may contain RFP waste. Contaminants in the SDA including chemicals, contact-and remote-handled fission and activation products, and TRU radionuclides are discussed in greater detail in Section 1.1.3.

Pit 4 was open to receive waste from January 1963 through September 1967. Based on the disposal practices at the time, containerized waste, primarily from the RFP, was initially stacked in the pit. In November 1963, this practice was changed, and containers were dumped into the pits rather than stacked to reduce labor costs and personnel exposures. Based on this operational change and the timeframe of disposal, the RFP waste within the designated retrieval area was most likely dumped rather than stacked. Additional waste from INEEL waste generators and some waste from off-Site generators also were disposed of in the pit.

The disposal process in the 1960s involved excavating an area in the SDA with tractor-drawn scrapers to the outcroppings of the underlying basalt, followed by backfilling and leveling the newly constructed pit floor with a layer of native soil approximately 0.6 m (2 ft) thick on which the waste would be placed. Waste in drums; cardboard, wood, and metal boxes; and other containers were disposed. After waste was emplaced, pits were backfilled and initially covered with about 1 m (3 ft) of soil, commonly referred to as overburden soil. The estimated overburden thickness in Pit 4 ranges from 1.2 to 2.1 m (4 to 7 ft). The additional soil thickness resulted from maintenance activities that added soil cover to the SDA in the 1970s and 1980s (Holdren et al. 2002; EG&G 1985). After approximately 40 years of burial, the original disposal containers, including the carbon steel drums, are expected to be significantly degraded similar to the drums removed in early 2004 as part of the Glovebox Excavator Method Project activities. Pictures of retrieved waste during the Glovebox Excavator Method Project can be viewed in Section 3 of the *Excavation Plan and Sequential Process Narrative for the Accelerated Retrieval Project for a Described Area within Pit 4*, ICP/EXT-04-00283 (Excavation Plan) (Preussner 2004).

Pit 4, shown in Figure 2, is located in the approximate center of the SDA and shares a common eastern boundary with Pit 6. Pit 4 has a surface area of 9,948.2 m^2 (107,082 ft^2). The total volume of Pit 4 is estimated at 45,307 m^3 (1,600,000 ft^3) (Holdren et al. 2002). The excavation area comprises approximately 21% of the overall area of Pit 4 with approximate dimensions of 38.4 × 74.1 m (126 × 243 ft), hereinafter referred to as the Pit 4 retrieval area. As discussed in this section, the Pit 4 retrieval area was selected because it contains high concentrations of TRU waste and also contains

significant volumes of other TW forms, including VOCs and depleted uranium. The approximate 0.2-ha (1/2-acre) size was selected, based on disposal records of the distribution of waste in the pit and other engineering factors (e.g., economies of scale associated with retrieval).

1.1.3 Estimated Waste Inventory in the Designated Retrieval Area of Pit 4

The OU 7-13/14 program has developed extensive information defining the waste inventories disposed of in the pits, trenches, and soil vault rows in the SDA. Disposal records and corresponding trailer load list information from the RFP are the ultimate source for the available information for the disposal locations and waste type designations. The OU 7-13/14 programs have developed a number of databases and supporting geographical information system applications to document waste inventory type, quantity, and location information. Based on this information, an engineering design file (EDF) has been developed, "Waste Inventory of the Described Area within Pit 4 for the Accelerated Retrieval Project within the Radioactive Waste Management Complex" (EDF-4478). The EDF summarizes the information on the volumes and types of waste that were disposed of in the Pit 4 retrieval area. Table 1 provides a summary of information contained in the EDF, including information describing the major waste streams located in the designated retrieval area from the RFP.

The RFP waste forms contain various radiological and nonradiological contaminants. The waste shipped to Pit 4 from the RFP included plutonium, americium, neptunium, and uranium isotopes. Plutonium isotopes included Pu-238, Pu-239, Pu-240, Pu-241, and Pu-242. Uranium isotopes (i.e., U-234, U-235, U-236, and U-238) were shipped to the RWMC in the form of depleted uranium oxides. Also included in the waste shipments were Am-241 and trace quantities of Np-237. The isotopes Am-241 and Np-237 are daughter products resulting from the radioactive decay of Pu-241. In addition to the Am-241 produced by the decay of the Pu-241, Am-241 removed from plutonium during processing at the RFP also was disposed of in Pit 4. This extra Am-241 is a significant contributor to the total radioactivity located in Pit 4. A number of radionuclides (e.g., Co-60, Sr-90, Y-90, Ba-137, and Cs-137), primarily from INEEL waste generators, are also expected to be encountered in the Pit 4 retrieval area. The non-RFP waste streams include radioactively contaminated sewage sludge and a number of combustible and noncombustible debris waste forms.

Waste management activities will be based on information from the various inventory documents identified in this document and additional acceptable knowledge (AK) documentation being prepared to support the NTCRA. In addition, analytical data collected during project activities will be used to determine appropriate management of primary waste streams.

The TRU radionuclides in Pit 4 are believed to be primarily contained in the drummed sludge and other RFP waste (e.g., graphite). General waste definitions are provided in Figure 3 for purposes of clarification. The general waste types presented include both expected retrieved waste types and waste types that will result from construction or operations support activities (e.g., secondary wastes).

There are a number of nonradioactive hazardous materials in the SDA that are present in trace amounts, of which neither the presence nor location can be verified and of which the exact quantities are unknown. These materials include picric acid, at least two 25-lb packs of sodium or potassium cyanide, lithium oxide from RFP battery waste, nitrobenzene, and polychlorinated biphenyls (PCBs) (Einerson and Thomas 1999).

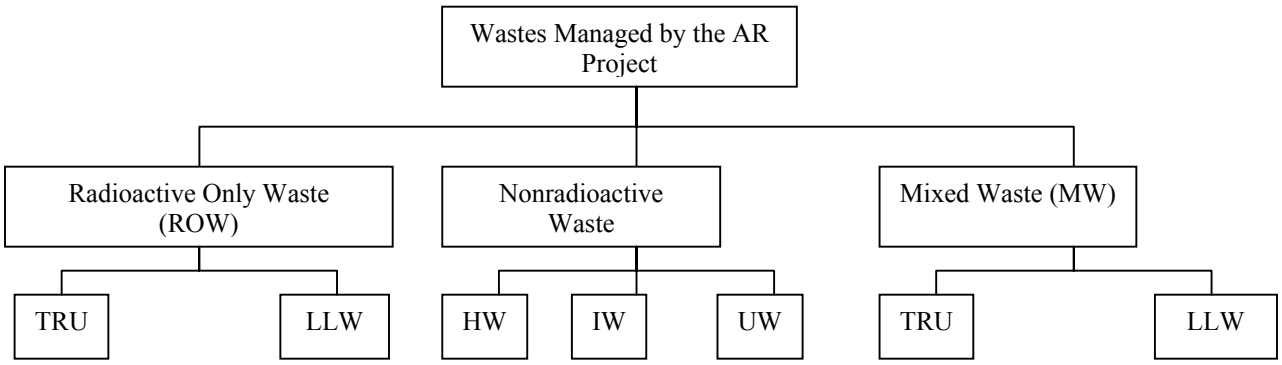
Nitrocellulose is a fire and explosion hazard. An analysis has been performed on the likelihood of explosive quantities of nitrocellulose present in the SDA and the likelihood of nitrocellulose formation in the SDA. This analysis concluded that the likelihood of a nitrocellulose explosion or the formation of nitrocellulose in the SDA is highly improbable, as described in the SAR-215 (2004).

Table 1. RFP waste content in the designated retrieval area of Pit 4 within the SDA.

Waste Stream	Item Description Code (IDC)	Summary Characteristics	Packaging	Estimated Waste Volume (ft^3)	TW/NTW
Series 741 first-stage sludge	001	Salt precipitate containing plutonium and americium oxides, depleted uranium, metal oxides, and organic constituents.	18.1 to 22.7 kg (40 to 50 lb) of Portland cement added to top and bottom of drum to absorb any free liquids. Encased in two plastic bags.	6,614	TW
Series 742 second-stage sludge	002	Salt precipitate containing plutonium and americium oxides, metal oxides, and organic constituents.	18.1 to 22.7 kg (40 to 50 lb) of Portland cement added in layers to absorb any free liquids. Encased in two plastic bags.	5,814	NTW
Series 743 sludge organic setups	003	Organic liquid waste solidified using calcium silicate (pastelike or greaselike).	113.6 L (30 gal) of organic waste mixed with 45.4 kg (100 lb) calcium silicate. Small quantities (4.5 to 9.1 kg [10 to 20 lb]) of Oil-Dri added to top and bottom, if necessary. Encased in two plastic bags.	5,123	TW
Series 744 sludge special setups	004	Complexing chemicals (liquids) including Versenes, organic acids, and alcohols solidified with cement.	86.2 kg (190 lb) of Portland cement and 22.7 kg (50 lb) of magnesia cement in drum followed by the addition of 99.9 L (26.4 gal) of liquid waste. Additional cement added to the top and bottom. Encased in two plastic bags.	690	NTW
Combustible, noncombustible, and mixed debris	Various	Solid radioactively contaminated combustible debris items such as paper, rags, cardboard, and wood. Noncombustible debris varies widely including pipe, empty drums, glass, and sand. Some waste is contaminated with beryllium metal.	Varies by process line generating the waste. Waste may have been wrapped in plastic or placed directly into the waste container.	68,898	NTW

Table 1. (continued).

Waste Stream	Item Description Code (IDC)	Summary Characteristics	Packaging	Estimated Waste Volume (ft^3)	TW/NTW
Roaster oxide waste	Unassigned	Incinerated depleted uranium. Primary chemical form is uranium oxide with some metal possible.	Packaged in metal drums with inner plastic bag packaging.	801	TW
Graphite	300, 301, 310, 311	Graphite mold pieces after excess plutonium removal. Molds are broken into large pieces before packaging. Graphite fines (e.g., scarfings) packaged in small bottles.	Drums lined with polyethylene bags and, most likely, a cardboard liner. Bottles of graphite fines were individually wrapped in plastic bags.	1,501	TW
Filters	490	Discarded high-efficiency particulate air filters contaminated with RFP radionuclides such as plutonium and americium.	Packaged in cardboard cartons and boxes depending on the timeframe of disposal.	12,593	TW



AR	accelerated retrieval
CH	Contact-handled wastes emit less than or equal to 200 millirem per hour (mrem/hr) of radiation at contact.
HW	hazardous waste – As defined by 40 CFR 260.10, hazardous waste means a hazardous waste as defined at 40 CFR 261.3.
IW	industrial waste - Solid waste generated by industrial processes and manufacturing; industrial waste is not radioactive, hazardous or mixed waste (40 CFR 243.101).
LLW	Low-level waste (LLW) is waste that is not high-level radioactive waste, spent nuclear fuel, TRU waste, by-product material (as defined in Section 11e[2] of the "Atomic Energy Act of 1954" [42 USC § 2011-2259, 1954]), or naturally occurring radioactive material (DOE O 435.1).
MW	Mixed wastes are wastes that are radiologically contaminated as defined by the Atomic Energy Act and are Hazardous Waste Management Act (HWMA)/RCRA-regulated as defined by the Idaho Administrative Procedures Act (IDAPA) 58.01.05.005 (40 CFR 261). Most wastes managed at the AR Project will be classified as MW.
Non-Rad	Nonradioactive wastes only applies to secondary waste and may be hazardous (i.e., HWMA/RCRA-regulated) or non-hazardous. Nonradioactive wastes are expected to be in limited quantities and may include industrial waste (IW) and universal waste (UW).
ROW	Radioactive only wastes (ROW) are wastes that are not HWMA/RCRA-regulated as defined by the IDAPA 58.01.05.005 (40 CFR 261). If any ROW is managed at the AR Project, it is expected to be secondary waste from such activities as drum loading.
TRU	Transuranic waste is waste without regard to source or form that is contaminated with alpha emitting TRU radionuclides (atomic number greater than 92) with half-lives greater than 20 years and concentrations greater than 100 nCi/g at the time of assay. The primary radionuclides associated with SDA RFP TRU waste are Pu-238, Pu-239, Pu-240, and Pu-242, and Am-241.
UW	universal waste – As defined at 40 CFR 260.10, universal waste means any of the hazardous wastes that are managed under the universal waste requirements of 40 CFR Part 273. Examples include batteries, pesticides, thermostats, and lamps.

Figure 3. General waste types.

1.2 Accelerated Retrieval Project Overview

This section provides a description of AR Project related facilities and activities. The AR Project construction activities include site development and utilities work, Retrieval Enclosure (RE) and airlock installation, and Storage Enclosure (SE) installation. The operational support facilities will be installed during the construction phase as determined appropriate by project and construction management.

1.2.1 Accelerated Retrieval Project Facilities

The AR Project uses an RE with airlocks, an SE, and other support facilities. These facilities are described in more detail in the following sections.

The site development work includes the removal of overburden in the area of the RE. The overburden soil is removed and staged in a designated area of the SDA for later possible return to the pit or other use within the SDA. The site utilities, building pads, power, communications lines, and other support utilities will also be prepared or installed.

1.2.1.1 Accelerated Retrieval Project Retrieval Enclosure. The RE depicted in Figure 4 is a temporary, relocatable structure that will house excavation, excavated NTW staging, and personnel and equipment ingress and egress activities. The RE provides weather protection to allow for year-round operations for AR Project activities. The RE is a commercially available fabric-tensioned structure,

approximately 51.8 m (170 ft) wide by 87.8 m (288 ft) long with a 6.1-m minimum (20-ft minimum) interior clearance at the eaves. Two attached structures, 21.3 × 15.2-m (70 × 50-ft) in size, house the airlock operations that include excavator and telehandler support capabilities and waste/soil examination, packaging, and sampling systems. The RE has sufficient space and interior height to house excavator operations and waste-conveyance activities. The RE and adjoining airlock structures will be installed in the area over Pit 4 where the overburden soil was previously removed.

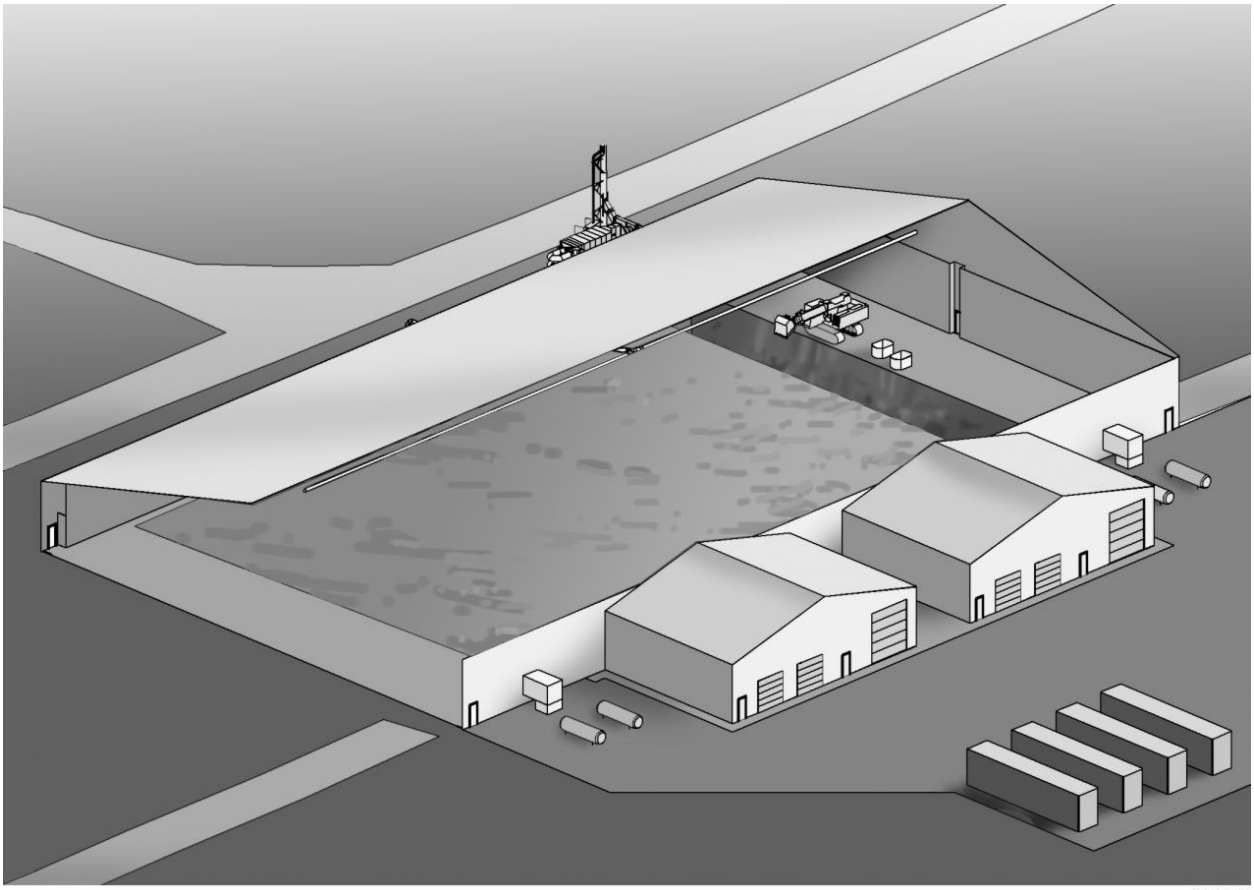


Figure 4. Depiction of the RE, showing the two attached airlocks and the retrieval area.

Ventilation is provided by a high-efficiency particulate air (HEPA)-filtered ventilation system. The exhaust stack is designed to minimize local worker exposure and permit proper installation of radiological emissions monitoring equipment. The ventilation system is equipped with an emissions monitoring system to sample and record possible releases of radioactive substances.

A direct-fired heating system will be used to heat the RE. The direct-fired heaters will minimize the potential for propane to enter the RE because of the high burn efficiency of the units. The heater is equipped with a spark-ignited intermittent pilot and a single-stage, 24-V gas valve.

The RE will be provided with electricity for auxiliary equipment and small electrical loads as required. Because of the mobile nature of the RE, extensive use will be made of flexible cords and cables as opposed to conductors in conduit. Lighting in the RE is both fixed position and mobile for adjusting to the excavation work areas. Adequate fixed lighting will be positioned to permit operators to safely walk throughout the RE.

1.2.1.2 Retrieval Enclosure Airlocks. The airlock structure is constructed to abut with the RE. The airlocks provide areas for equipment maintenance, operator entry to the retrieval area and drum packaging stations, remotely observing excavation activities, and performing decontamination activities. The buffer areas also provide for personal protective equipment (PPE) changeout. The airlocks are

designed to flow approximately six air changes per hour, with the airflow going from outside the airlocks, through HEPA filters mounted in the airlock structure walls, and into the RE. Electric radiant spot heaters provide localized heating, and air conditioning is provided to maintain adequate working temperatures in the airlock structure.

1.2.1.3 Storage Enclosure. The SE, depicted in Figure 5, is a temporary structure that provides indoor storage of containerized waste. The SE is a commercially available fabric-tensioned structure, approximately 39.6 m (130 ft) wide by 48.8 m (160 ft) long with 6.1-m minimum (20-ft minimum) interior clearance at the eaves. The SE is constructed of a prefabricated metal frame covered with an outer PVC-coated polyester fabric membrane. The interior floor is constructed of reinforced concrete. Mechanical and electrical equipment supporting the SE is housed external to the SE. The SE is not heated but may be ventilated to minimize accumulation of VOCs, as required.

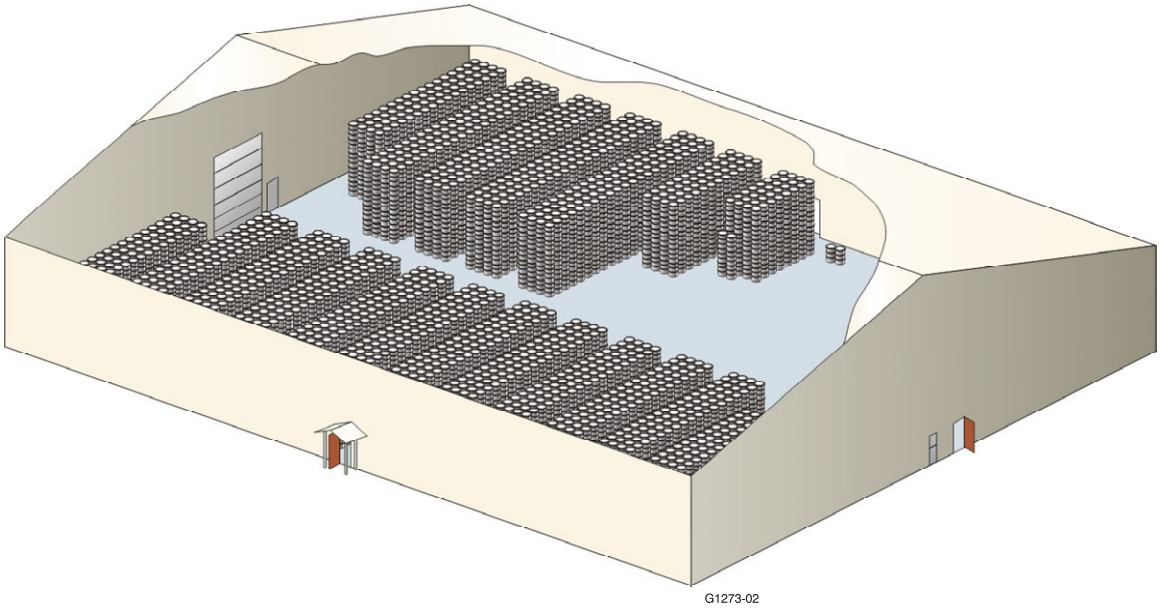


Figure 5. Depiction of the SE, showing an example of containers stored in the modified dense pack configuration.

The requirements for container storage (40 Code of Federal Regulations [CFR] 264, Subpart I) are identified as applicable or relevant and appropriate requirement (ARARs) to address the storage of containerized waste within the AR Project area of contamination. Although modified by a dense pack configuration, the SE will satisfy the substantive Subpart I requirements for storage of hazardous waste. With the planned modified dense pack storage arrangement, the SE is capable of storing approximately 12,480 drums. As discussed in Section 2.4, storage of retrieved waste streams may be performed alternatively within the RCRA-permitted storage module, WMF-628, located within the RWMC TSA.

In addition to the SE, other storage areas are planned for use to store containerized secondary waste. These other areas consist of cargo containers used for the accumulation of secondary waste. The cargo containers would be registered as CERCLA waste storage areas under INEEL management control procedures and managed in accordance with the ARARs identified in Appendix A. The containers will be located on the asphalt pad located adjacent to the RE (i.e., south side of the RE). The cargo containers would not store waste that is removed from the pit. The containers would be used to store solid waste streams that are eligible for short-turnaround disposal such as PPE, decontamination equipment, and wastes from routine radiological surveys.

1.2.1.4 Operational Support Facilities. Operational support facilities include a mobile fissile material assay unit(s), breathing air unit(s), mobile sample support unit, and operations support trailers. The support facilities will be used as required to support operations, including providing a general work area, a viewing area with monitors for visual observation, PPE changeout, storage, and utility housings. The support facilities will be positioned near the RE and will be used by operations to support the activities performed onsite in the SDA and within the RE.

2. REMOVAL ACTION WORK ELEMENTS

This section provides a description of the AR Project removal action work elements.

The excavation process will use manned heavy equipment to retrieve targeted TRU waste from within the RE. The heavy equipment used for retrieval will be equipped with a sealed, pressurized, HEPA-filtered cab. Additionally, the operators may use self-contained breathing air or other appropriate respiratory protection.

During the construction phase of the project, overburden soil was removed to a specified depth. Upon completion of construction and turnover of the RE, readiness activities will be performed in accordance with relevant DOE Order requirements to ensure operational preparedness.

In summary, the retrieval process consists of:

- Removing clean overburden;
- Erection of RE, SE, and support facilities;
- Excavating a soil layer declared as potentially contaminated soil (PCS) above the waste zone;
- Excavating waste from the waste zone and separating TW from NTW;
- Leaving NTW in the excavation area;
- Visually examining and packaging TW in containers (e.g., typically 55-gal drums);
- Random sampling of the excavation site per agreement with Waste Isolation Pilot Plant (WIPP);
- Assaying the drummed waste;
- Temporarily storing waste in the CERCLA storage areas;
- Performing headspace gas sampling (TRU waste only);
- Performing gas-generation testing on drums that fail headspace gas sampling (TRU waste only);
- Performing limited VOCs treatment of drums that fail gas-generation testing (TRU waste only);
- Loading and shipping the packaged TRU waste to WIPP; and
- Treating and/or disposing of remaining containers, including containers of NTW that are removed from the RE (e.g., as part of sampling activities), and TW that is later determined not to be eligible for WIPP disposal.

Removal of the TW streams will mitigate future potential risk by removing from the retrieval area the RFP waste streams that contain significant concentrations of the contaminants of concern (COCs) in RFP waste identified in the OU 7-13/14 risk assessment work that has been completed to date. Potential risk associated with the COCs not addressed through the proposed NTCRA (i.e., in other locations within the SDA) ultimately will be addressed through the selected remedial alternative to be documented in the OU 7-13/14 comprehensive Record of Decision (ROD).

2.1 Construction Activities

The major phases planned to complete the construction work on the AR Project are listed below:

- **Site Development:** Site construction consisted of overburden soil removal, existing road improvements, laydown area development, enclosure and trailer pad preparation, and installation of temporary electrical power. Additional earthwork activities included developing permanent and temporary construction access ramps and roads to the AR site, and placement of a dust-suppressing agent at designated locations.

  - Overburden soil removal was performed as part of the construction activities associated with the AR Project. Approximately 0.6 m (2 ft) of overburden soil was removed under this initial campaign. The overburden soil was piled in the SDA for future use and/or spread, to meet the requirements for RWMC operations. The overburden soil piles were coated with Soiltac, a non-hazardous vinyl acrylic copolymer emulsion that binds the soil particles together to form a surface resistant to fugitive dust emissions.

  - After the top layer of clean overburden soil was removed from the retrieval area, the exposed, graded soil was coated with Soiltac so that a durable working surface is available for the operation phase. After the graded soil was coated, the product was mixed into the soil to a depth of 10 cm (4 in.). When cured and compacted, a hard, relatively dust free surface was produced that can support the operation of construction equipment. The remaining 0.6 m (2 ft) of overburden soil, referred to as potentially contaminated soil (PCS), will be removed during the first phase of remedial operations.

  - A woven geo-textile material was placed on the new roads and structure pads prior to placement of clean fill. Site development included installation of an electrical power and communications duct to the AR Project site. Asphalt paving associated with the site development was performed upon substantial completion of the RE.

- **Structures:** The major enclosure structures associated with the project are the RE and SE. See Section 1 for a brief description of these two structures. Upon delivery of the government furnished equipment, erection activities will begin on the steel framing and fabric installations. To accelerate and maintain schedule, full use of resources will be used to work many areas concurrently.

- **Mechanical, Electrical, and Supporting Equipment:** Installation of the supporting systems to the RE and SE will involve connection of utilities and installation of electric power, lighting, grounding, lightning protection, ventilation, fire alarm systems, communication systems, dust suppression on the excavator, breathing air systems, radiological monitoring equipment, and fissile monitoring systems (in the assay trailer), as required. Major mechanical and electrical equipment supporting the retrieval operations will be housed outside of the enclosures.

2.2 Readiness and Startup Activities

This section provides a description of the startup activities required prior to operations. Initiation of retrieval and waste processing activities will be conducted in accordance with DOE orders. Project retrieval activities will be evaluated through a management self-assessment process, followed by contractor and DOE readiness reviews. Readiness for other support functions, including drum packaging, assay, and waste storage, will be assessed through a management self-assessment process. Retrieval startup will be authorized by DOE.

The six phases for the operations, testing, and maintenance strategy for the AR Project are discussed below.

- Phase 1 will provide for the development of operating and maintenance planning. Administrative, operations, and maintenance procedures and policies, as well as facility readiness and test plans, will be developed in accordance with applicable company procedures.
- Phase 2 will provide for the development of the detailed procedures for the operation, maintenance, and testing of facility equipment and systems.
- Phases 3A (training procedures) and 3B (operations staff up) will provide for the development of the necessary AR Project training program requirements, staff the AR Project, train and/or qualify the AR Project operational staff, and will occur concurrent with Phase 2.
- Phase 4 will be used to accept turnover of the AR Project from construction. The AR Project operations team will validate the detailed operation and maintenance procedures developed in Phase 2.
- Phase 5 will be used to validate AR Project readiness.
- Phase 6 is the AR Project operations phase.

The AR Project team has developed and will continue to refine a discrete-event computer simulation model of the process that provides insight into the operational processes as well as a prediction of the operational duration.

2.3 Operations

This section provides a brief description of AR Project operations. Operating crews will be established to conduct retrieval activities to align with the AR Project schedule. Operations will be based on manned operations of equipment within the RE. The operational activities include retrieval of waste from the waste zone; waste sampling, examination, and packaging; and facility closure activities. The operations team will use a manned excavator and appropriate PPE will be used to ensure worker safety.

The initial effort to retrieve waste from the excavation area will begin with removal of approximately 0.6 cm (2 ft) of PCS that lies directly atop the waste. Using the excavator, the heavy equipment operator will scrape and lift PCS from a predetermined area, without driving the excavator directly on the waste. The PCS material will be staged in a pile within the RE. Current planning indicates that the staged PCS will be used as an initial cap for the NTW to remain in the pit following removal of the TW streams.

The information on the types of waste and associated volumes that were disposed of in the Pit 4 retrieval area includes the general location within the Pit 4 retrieval area that the waste was placed. This information is available to the operators to assist with identifying waste types and potential hazards associated with the waste. (See Table 1 for additional information.)

In-pit segregation, using visual inspection methods, will be the primary method for identifying and segregating TW and NTW. Existing AK enables operations, based on the appearance of the different waste types encountered during excavation, to identify TWs when unearthed.

2.3.1 Waste Excavation

Operators in PPE will operate a trackhoe type excavator to retrieve material from a described area within Pit 4 into waste containers. The waste zone is expected to be 3.4–4.6 m (11–15 ft) deep and the walls will be sloped to maintain an angle of repose of approximately 1:1 (i.e., 45 degrees). At the digface, the excavator will retrieve TW (e.g., graphite, filters, 741 and 743 sludge, uranium, and commingled soil) and place the waste in a tray that has been fitted with a plastic liner (soil intermixed with TWs are expected within the tray). The TW/NTW determination will be made by an individual assisting the excavator operator, using two-way radios and closed-circuit television cameras mounted on the excavator. The trays of TW will be transported to a drum packaging station by telehandler. Field screening with radiological instrumentation will be employed to identify wastes associated with high-energy gamma and

neutron radiation to ensure that the associated wastes are managed appropriately and that potential radiation exposure of operations personnel is appropriately controlled.

NTW will require consolidation within the RE to establish the initial excavation trench. NTW from the initial trench will be temporarily consolidated in soft-sided boxes within the RE. Once excavation has progressed further along the excavation path, sufficient space will be available to allow excavator transfer of NTW from the active digface portion to the opposite inactive digface without this consolidation step. Consolidated NTW will then be relocated to the inactive digface and covered with PCS materials as part of the operations process. Excavation will not target removal of the underburden soil, although some underburden soil is expected to become commingled with targeted waste during retrieval. Limited underburden sampling will be performed as described in Section 3.6.

In addition to the Soiltac added after removal of the overburden soil, dust suppression may be used during the retrieval process as conditions warrant. This activity may include addition of localized water, additional Soiltac, or other dust suppressants. Dust suppressants may be used locally from the excavating equipment, or dust suppressant applicators may be utilized.

As part of retrieval, TW may require exposure and/or size reduction.

Based on Glovebox Excavator Method Project experience, waste inventory records, and the time since initial disposal, little if any free liquids are expected to be encountered during retrieval. If encountered and released through the retrieval activities, it is anticipated that the uncontained free liquid will absorb into the surrounding waste and soils in a relatively short time frame. Once absorbed, the resulting waste will be retrieved as part of normal operations. If necessary, additional soil may be combined with uncontained free liquid that does not naturally absorb during the retrieval process. Any remaining uncontained free liquids associated with TW examined in the drum packaging stations will be absorbed by operations personnel before the waste is repackaged. (Discussion of management steps for containerized free liquids is provided in Section 3.1.3.5.)

2.3.2 Completion of Retrieval

Once the retrieval campaign is complete, staged PCS and any remaining consolidated NTW will be used to backfill the remaining trench. Additionally, wastes removed from the facility that cannot be sent to WIPP and have been treated for volatile organics could potentially be placed within the remaining open trench prior to backfill. Additional treatment for returned waste may be required, pending final characterization of the waste and final hazardous waste determinations (HWDs). As discussed in Section 2.8 below, DOE will give preference to disposal options, such as offsite treatment and disposal, that do not involve a return to pit, and will only consider returning wastes to the pit that do not present unacceptable risk to the aquifer subject to agreement with the DEQ and EPA. In the event that the open trench volume is not completely filled with the returned PCS, NTW, or potentially returned waste, the trench volume could be filled using several methods including:

1. Filling the open trench volume with a retrievable grout (i.e., low compressive strength), using a hose to penetrate the enclosure

2. Transferring of additional soil material into the retrieval area.

2.3.3 Airlock Operations

As depicted in Figure 2, the RE has two airlocks attached. One airlock is used for maintenance, and the second airlock is used to perform waste examination, sampling, and packaging operations.

2.3.3.1 Maintenance Airlock. Maintenance of contaminated equipment used during the retrieval process will be performed in the maintenance airlock. This airlock will also be used to perform some decontamination.

2.3.3.2 Waste-Handling Airlock. There are six drum packaging stations within the airlock. Waste is brought to the drum packaging stations in lined trays. Waste received in the waste-handling airlock are monitored for radiation levels (e.g., high gamma radiation levels) and visually examined for WIPP-prohibited items. After the visual inspection, any required samples will be collected (see Section 3.6). Based upon the results of the initial inspection, NTW may be consolidated and placed into the original excavation.

TW is further processed at a drum packaging station similar to Figure 6. TW is visually examined by WIPP-trained personnel for liquids or other WIPP-prohibited items. Any liquids are absorbed, using soil or other suitable absorbents, and any WIPP-prohibited items are removed from the tray. WIPP-prohibited items are handled similar to other non-WIPP compliant waste as described in Section 2.8. A visual examination record is generated, including waste contents, estimated volumes, and weights.

The tray liner containing the TW is lifted, formed into a bag, placed into a bar-coded 55-gal drum, and sealed. The drum is weighed, and a vented lid is placed onto the drum. The closed drum is then decontaminated (as required) and transferred to the assay trailer.

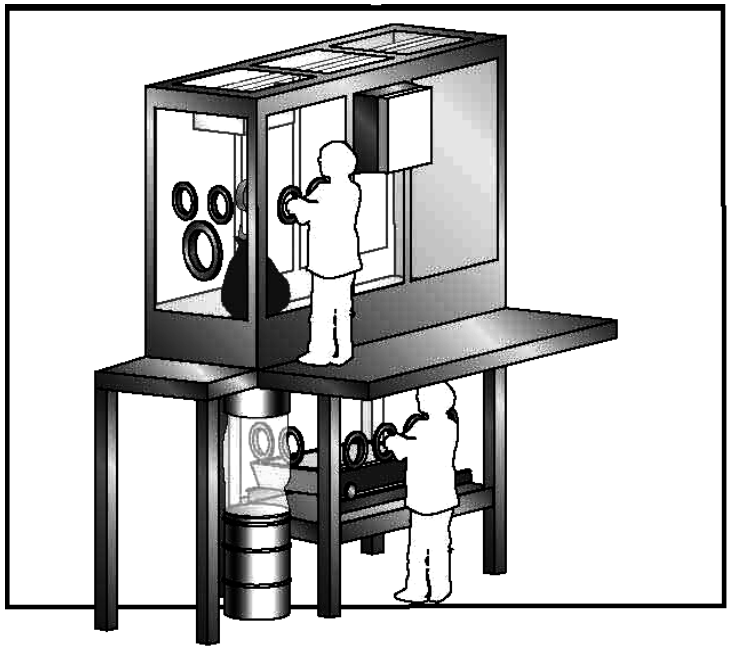


Figure 6. Artist rendition of typical drum packaging station (safety features such as the safety railing are not depicted).

2.3.4 Container Storage

Containers are assayed to ensure fissile gram equivalent (FGE) limits are met for maintaining criticality safety. Any drum with >380 g FGE is identified and transferred to special-case storage (i.e., criticality control area) and/or transferred to the drum packaging stations for repackaging into multiple containers. All other containers are transferred to interim storage awaiting further characterization in the Central Characterization Project (CCP). Characterization in the CCP will consist of assaying for TRU content, headspace gas sample analysis, and gas generation testing, if required. See Section 2.5 for additional information on WIPP shipment activities.

2.4 Interim Storage

The SE, depicted in Figures 2 and 5, is a temporary structure that provides the primary indoor storage and staging of packaged waste. See Section 1 for a description of the SE. See Appendix A for information addressing SE operations, the related requirements, and a description of the actions taken to meet those requirements. In addition to the SE, secondary waste may be stored in cargo containers located adjacent to the RE as described in Section 1.2.1.3 above.

Storage of retrieved waste streams may be performed alternatively within the RCRA-permitted storage module, WMF-628, located within the RWMC TSA. The RCRA permit was previously modified to allow storage of CERCLA wastes in association with performing the Glovebox Excavator Method Project. Storage of AR Project waste within WMF-628 will require compliance with the requirements of the INEEL Hazardous Waste Management Act (HWMA)/RCRA Permit, for RWMC (i.e., Volume 5). The waste acceptance criteria for storage of AR Project retrieved waste within both the SE and WMF-628 are in Appendix B.

2.5 WIPP Interface Activities

The removal action will establish process details for certification and transfer of formerly buried TRU waste to the WIPP. The newly packaged waste will be evaluated for potential transfer to WIPP. Payload containers (e.g., individual drums, standard waste boxes, and 10-drum overpacks) will be assembled for transfer to WIPP in transuranic package container (TRUPACT)-II or HALF-PACT containers. Payload containers that are certified to meet the WIPP waste acceptance criteria (WAC) will be transported to WIPP for final disposition.

The WIPP CCP will provide TRU waste characterization, certification, transportation, and final disposition of retrieved TRU waste. WIPP and Idaho Completion Project (ICP) will work in collaboration to comply with applicable regulations to safely disposition TRU waste. Sampling and analysis conducted for chemical characterization is described in Section 3.6.

2.5.1 TRU Waste Disposition

The AR Project TRU waste management approach for achieving disposition of retrieved TRU waste includes the development of baseline information supporting planning and future disposition activities, implementing visual examination and area-based sampling under the WIPP-approved CCP program, and addressing future deployment of CCP characterization capabilities. The philosophy for achieving disposition of retrieved buried TRU waste is based on:

- Minimizing the level of infrastructure created or required at INEEL for waste certification by WIPP
- Maximizing use of the national WIPP CCP capabilities and resources to perform characterization, certification, and transportation functions to achieve disposal of retrieved buried TRU waste.

The envisioned approach, pending approval from WIPP, for achieving disposition of retrieved TRU waste, is as follows:

- Develop approaches that comply, or can be negotiated, with WIPP on characterization of buried TRU waste.
- Develop information for all RFP and INEEL-generated wastes disposed of in Pit 4 retrieval area. The development of AK information is an essential activity for assigning EPA hazardous waste numbers (HWNs), determining waste streams, and planning characterization approaches for retrieved waste that will be disposed of at WIPP. Information obtained from the Glovebox Excavator Method retrieval and sampling will be incorporated into the AK file for RFP waste.

- Establish interface with the WIPP CCP to support development of retrieval and disposition plans, programmatic documents, and procedures; and provide oversight of sampling and visual examination operations performed by ICP personnel under WIPP-approved CCP procedures

- Complete the *WIPP/RCRA Field Sampling and Analysis Plan for the Accelerated Retrieval Project for a Described Area within Pit 4* (Arbon 2004[a]) for characterization of retrieved TRU homogeneous solids and soil/gravel waste forms and obtain approval from the U.S. Department of Energy Carlsbad Field Office. Approval of this plan and incorporation into operating procedures will be needed prior to retrieving waste. This sampling plan will be updated in FY-05 to reflect analytical results from sampling efforts in the initial 0.1 ha (1/4 acre) (approximated) for the next 0.1 ha (1/4 acre) (approximated) to be retrieved, if required. A three-dimensional, random, area-based sampling program will be established for characterizing both homogeneous solids and soil/gravel wastes. Samples will be collected in the waste zone and submitted to the Idaho Nuclear Technology and Engineering Center laboratory, currently under an approved WIPP certification program, for analysis. Results would be applied to all TRU homogeneous solids and soil/gravel waste containers produced from retrieval operations.

- Implement visual examination of retrieved waste to verify compliance with WIPP requirements under the CCP program. Visual examination will be performed to verify absence of prohibited items, determine contents and material parameter weights, and assign to an appropriate waste stream. ICP personnel for both sampling and visual examination will be trained and qualified by CCP.

- Retrieve targeted buried TRU waste forms and package into drums suitable for storage pending future characterization and certification under a WIPP-approved program.

- Deploy the CCP mobile systems to INEEL to support additional characterization, certification, and transportation operations to allow shipment of waste to WIPP. These operations include radioassay and headspace gas sampling of drums.

- Validate results from characterization activities and certify the waste for shipment to WIPP.

- Complete chemical compatibility evaluations to support future TRUPACT-II of HALF-PACT shipments and submit information required to establish TRUPACT Content Code shipping codes for retrieved waste.

- Use TRUPACT-II or HALF-PACT loading equipment to prepare payloads for shipment to WIPP.

- Support planning for deployment of CCP to INEEL to perform remaining characterization activities and certify and transport the retrieved Pit 4 waste to WIPP for disposal.

2.6 Interim Closure

The AR Project will implement interim closure steps, including covering the disturbed portion of the pit with a layer of soil approximately 0.9 m (3 ft) thick from the remaining overburden soil or other soil from the INEEL. The cover layer will be compacted and graded consistent with the overall SDA grading and drainage plan. Final closure of the Pit 4 retrieval area will not occur as part of the NTCRA, but will occur for the overall SDA closure as specified in the pending OU 7-13/14 ROD. This final closure of the SDA is assumed to include an engineered, multilayered soil cover that will encompass Pit 4.

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a. Arbon, Rod, 2004, *WIPP/RCRA Field Sampling and Analysis Plan for the Accelerated Retrieval Project for a Described Area within Pit 4*, ICP/EXT-04-00329, Rev. 0, Draft, Idaho Completion Project.

2.7 Treatment

The waste that does not pass WIPP-related acceptance criteria (e.g., gas-generation testing) may require treatment for constituents such as VOCs. As stated in the EE/CA, a thermal desorption process for treatment of VOCs is being evaluated to support this function. Decisions regarding specific treatment technology will be made in conjunction with DOE Idaho, EPA, DEQ, and other stakeholders. A Remedial Design Fact Sheet will be utilized to brief the public.

Treatment options will be identified if retrieval of waste has occurred that is unacceptable for shipment to WIPP or another waste-receiving facility. Final selection of a treatment method will be based upon waste characterization information, regulatory requirements, stakeholder input, and technological feasibility. Details of the potential VOC or other treatment processes will be fully developed during the design process for the system. Treatment system design and other supporting documentation, such as any required risk assessment and test planning documentation, will be developed and submitted to the regulatory agencies in support of treatment system construction and implementation. The currently identified ARARs associated with treatment are identified in Appendix A.

2.8 Alternative Disposal

Waste profiles will be developed for retrieved waste that cannot be shipped to WIPP. This waste will remain in storage pending an acceptance determination from alternate treatment and disposal facilities. DOE will give preference to disposal options, such as offsite treatment and disposal, that do not involve a return to pit, and will only consider returning wastes to the pit that do not present unacceptable risk to the aquifer subject to agreement with the DEQ and EPA. In the event that retrieved wastes are identified to contain PCBs $\geq$ 50 ppm, the wastes will not be eligible for return to the pit without supportive risk-based disposal approval or other compliant treatment.

2.9 Shutdown and Decontamination

Planning for facility shutdown and decontamination activities is in preliminary development as of the issuance of this document. The preliminary planning shows that the project team will prepare the required design, decontamination and other technical documentation (e.g., health and safety plans and air emissions evaluations) to support shutdown and decontamination activities in FY-05. Based on the preliminary planning, actual facility shutdown and decontamination activities would not occur until the post-FY-05 time frame and would, at minimum, include decontamination of the facility so that it could be reused or relocated, if required. Appropriate shutdown and decontamination phase documentation will be provided to the regulatory agencies for their review and comment before the activities are initiated. Documentation will include ARARs consideration for the work to be performed as is appropriate for an activity conducted as part of a CERCLA NTCRA.

3. REGULATORY COMPLIANCE

This section provides information addressing AR Project waste management strategies and a listing of the AR Project ARARs.

3.1 Waste Management

Pit 4 retrieval activities will involve the retrieval and characterization of a variety of waste forms that will initially result in packaged containers of retrieved waste requiring interim storage. Interim storage will occur in the SE or WMF-628 and other CERCLA storage areas located in the SDA while awaiting assay results, completion of HWDs, and other required documentation. The majority of the retrieved waste is expected to meet the WIPP WAC for disposal.

The AR Project comprises distinct phases: construction, overburden removal, Pit 4 waste retrieval and associated operations, facility shutdown, facility layup (potentially), and finally deactivation, decontamination, and decommissioning (DD&D) of the facility structures and equipment. Accompanying the retrieval of the Pit 4 wastes is the generation of various secondary waste streams.

Various waste types, as described in Figure 3, will be generated from the Pit 4 retrieval process. Waste will be produced from two waste sources as described below.

- **Secondary waste**— A generic category for waste generated from support activities related to retrieving, processing, sampling, and packaging AR Project waste. Examples of secondary waste include waste from decontamination activities, personal protective equipment from maintenance and operations, used equipment, and sampling materials. Secondary waste is generated during all project phases.

- **Pit 4 Retrieved waste**—Wastes (waste or soils) that were originally disposed of in the Pit 4 retrieval area including interstitial soils and waste (e.g., debris and sludges).

Interim storage of certain newly generated and retrieved waste streams in the SE and other CERCLA storage areas is also planned. Storage in the SE will include provisions for waste in containers on a concrete pad and in a temporary building. Analytical results and associated HWDs performed for these waste streams will determine the final disposal location. It is anticipated that newly generated and retrieved waste streams will require management as one or more of the waste types listed in Figure 3. As noted above, storage of retrieved waste streams may be performed alternatively within the RCRA-permitted storage module, WMF-628, located within the RWMC TSA.

Depending on the disposition pathway, waste will be defined and characterized in accordance with WAC from the appropriate facility. The WAC provided in Appendix B will apply to the SE and to storage of AR Project retrieved waste in WMF-628. As noted, the INEEL CERCLA Disposal Facility (ICDF) WAC (INEEL 2002a) may apply to certain secondary waste streams if sent to ICDF for disposal. In addition, applicable INEEL management control procedures (MCPs) and federal and state regulations for identifying waste will be implemented. A more detailed discussion about waste identification is included in succeeding sections.

3.1.1 Waste Management Assumptions and Regulatory Considerations

All of the waste streams identified in this document will be managed in accordance with the ARARs outlined in Appendix A when managed in CERCLA storage areas. Administrative requirements such as timeframes or reporting requirements do not apply to the waste remaining in CERCLA storage, but may be implemented if required by internal INEEL procedures or may be adopted as best management practices. Waste shipped to a treatment, storage, and disposal (TSD) facility outside the INEEL will comply with the off-Site rule 40 CFR 300.440, “Procedures for Planning and Implementing Off-Site Response Actions.”

3.1.2 Hazardous Waste Determination

To ensure appropriate management of waste generated during project activities, an HWD conducted in accordance with 40 CFR 262.11, "Hazardous Waste Determination," will be performed for each waste stream.

Concurrent with the preparation of this RAP, efforts are ongoing to complete the AK documentation associated with the waste buried in the designated retrieval area. The AK documentation and associated references provide detailed information relating to facility histories and process operations. AK information is obtained from numerous sources, including facility safety basis documentation, facility procedures, generator and storage facility waste records, and interviews with cognizant personnel. The draft AK summary report, titled *Central Characterization Project Acceptable Knowledge Summary Report for A Described Area in Pit 4 at the Idaho National Engineering and Environmental Laboratory*[b], was used as the primary source of preliminary HWD background information in this RAP. The following subsections describe the preliminary HWDs for various waste types expected to be encountered during retrieval based on the draft AK summary report. The preliminary HWDs function primarily to guide onsite CERCLA waste management planning assumptions. Final waste management planning assumptions that guide initial waste management and storage will be based upon the finalized AK summary report that will be completed before waste retrieval operations. Subsequent to waste generation, sampling, and analysis, any or all of the waste may be reclassified. Before ultimate disposal, waste may need to be further characterized to ensure compliance with WAC for the receiving facility.

3.1.3 Preliminary Hazardous Waste Numbers

It is expected that the primary waste stream from the AR Project activities will consist of commingled, originally disposed waste streams. This expectation is realized because retrieval with the trackhoe-type excavator will lead to some commingling of the buried waste. In addition, the original waste containers are assumed to have lost their integrity through long-term corrosion (i.e., intact drums of waste are not expected to be encountered during retrieval).

3.1.3.1 Characteristic Hazardous Waste Numbers. A number of preliminary toxicity characteristic HWNs are identified as applying to the retrieved waste based on the draft AK summary report. These toxicity characteristic HWNs include the following toxicity characteristic metals and organics: D004-D011, D022, and D029.

The following paragraphs that deal with the characteristics of ignitability, corrosivity, and reactivity are taken directly from the draft AK summary report. In general, the conclusion is that the repackaged targeted waste stream should not exhibit ignitability, corrosivity or reactivity. Verification of this conclusion will occur as part of the final HWD evaluation, following visual inspection and final packaging. Although in some instances the historical processes did generate chemicals or waste forms that in and of themselves could lead to the assignment of one of these HWNs (e.g., a liquid that is potentially corrosive), operational steps will be implemented to ensure that the final packaged targeted waste form does not exhibit characteristics that are WIPP-prohibited. Examples of these operational steps, discussed further below, include absorption of free liquids and removal of prohibited items, such as containers of free liquids. Waste management planning associated with any special case items that are removed from the waste stream destined for WIPP is discussed in Section 3.1.3.5 below.

Ignitability

The debris materials in these waste streams do not meet the definition of ignitability as defined in 40 CFR 261.21. The materials are not liquid, ignitable compressed gases, or oxidizers, and are not capable of causing fire through friction, absorption of moisture, or spontaneous chemical change.

b. Wastren Energy Services, 2004, *Central Characterization Project Acceptable Knowledge Summary Report for a Described Area in Pit 4 at the Idaho National Engineering and Environmental Laboratory*, CPP-AK-INEEL-001, Draft B of Rev. 0.

Any uncontainerized liquids discovered during retrieval or packaging are absorbed into the soil or other suitable absorbents. Bottles of chemicals will be removed from the waste during retrieval and packaging operations. Ignitable compressed gases (e.g., unpunctured aerosol cans or compressed gas cylinders) may be present in the waste. These items are discussed in Section 3.1.3.5 below.

Based on review of AK documentation, numerous oxidizers (e.g., chromates, nitrates, perchlorates, permanganate, peroxides) have been identified in processes that generated the waste buried in Area 1. There is the possibility that bottles of chemicals, including oxidizers, were buried in the SDA. For that reason, bottles of chemicals (solids and liquids) will be removed from the waste during retrieval and packaging operations. Cellulosic (e.g., wipes) waste items may be contaminated with oxidizers; however, tests performed by Savannah River Site in 1984 to determine burning characteristics of wipes and mop heads contaminated with nitric acid and potassium permanganate indicated that these wastes are not considered oxidizers.

Depleted uranium machine turnings were thermally stabilized to an oxide (i.e., roaster oxide); however, due to incomplete oxidation of some of the turnings, combustion may be possible if unoxidized surfaces are exposed to oxygen. Other radioactively-contaminated machine turnings from RFP were typically cemented. Small quantities of laboratory metals used at RFP such as potassium and sodium were reacted with alcohol in the labs. Sodium and sodium-potassium metals from ATI were encased in concrete and, therefore, do not pose a hazard. Other pyrophoric materials, such as zirconium chips from INEEL generators, were buried in the pits.

There is the possibility of nitrocellulose formation on acid-contaminated combustibles and plastics, as these were not rinsed prior to 1974. However, self-ignition due to nitrocellulose formation would have occurred within a relatively short period of time, and the nitrocellulose would have degraded significantly over the nearly 40 years in storage.

Because the waste in Area 1 was buried nearly 40 years ago, and there have previously been floods in the SDA, the waste containers have been significantly degraded. As a result, the potential risk for any chemical reaction is expected to be significantly reduced. Therefore, EPA HWN D001 is not assigned. The waste will be observed for any ignitability characteristics during retrieval and packaging operations.

Corrosivity

The debris materials in these waste streams do not meet the definition of corrosivity as defined in 40 CFR 261.22 because the waste is not liquid. Any uncontainerized liquids discovered during retrieval or packaging are absorbed into the soil or other suitable absorbents. Bottles of chemicals will be removed from the waste during retrieval and packaging operations. There is the possibility that lead-acid batteries were buried. Any liquid that may be remaining in these batteries will be removed and treated. Therefore, EPA HWN D002 is not assigned.

Reactivity

The debris materials in these waste streams do not meet the definition of reactivity as defined in 40 CFR 261.23. The materials are stable and will not undergo violent chemical change. The materials will not react violently with water, form potentially explosive mixtures with water, or generate toxic gases, vapors, or fumes when mixed with water. The materials do not contain cyanides or sulfides in concentrations sufficient to generate toxic gases, vapors, or fumes.The materials are not capable of detonation or explosive reaction if subjected to a strong initiating source or if heated under confinement. The materials are not readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

Water reactive metals (e.g., calcium, lithium, and magnesium) have been identified in several documents. Small quantities of laboratory metals were reacted with alcohol in the labs. Larger quantities were burned in pits at RFP.

Cyanide pellets were distributed among drums of second-stage sludge. A 1967 logbook for 742-series sludge specifies cyanide pellets in a drum generated in August 1967. This drum will not be in Area 1 because the last date waste was buried in Area 1 is April 1967. Because earlier 742-series sludge logbooks have not been located, it is not known if cyanide pellets were disposed of in 742-series sludge prior to 1967. However, cyanide plating operations were limited in the 1960s, and disposal of cyanide pellets would not have been a routine practice. No other specific information has been found that indicates cyanide pellets were disposed prior to this time. If packages or bottles of cyanide pellets are identified in the sludge during visual examination, they will be removed from the waste streams and handled as special case items. Cyanide solutions used in Buildings 444 and 881 were treated to destroy the cyanide.

Prior to 1970, ion-exchange resins may not have been de-nitrated (washed with water) or mixed with cement prior to disposal. In the past, there was some question if the resins that have dried out represent a flammable or explosive hazard. However, studies indicate that no credible mechanism exists for spontaneous detonation by degradation of a nitrate-form ion-exchange resin.

Previous studies identified the potential for shock sensitivity or violent exothermic reaction of leaded gloves exposed to nitric acid under the proper conditions. However, because the waste in Area 1 was buried nearly 40 years ago, and there have been previous floods in the SDA, the proper conditions do not exist for the gloves to be reactive.

Small quantities of explosives were used at RFP; however, they were strictly regulated and controlled and would not have been placed in drums for burial. Explosives, such as blasting caps and primacord, were used at several INEEL facilities. No information has been found that indicates how explosives from INEEL generators were managed. Explosive chemicals, such as hydrazine and picric acid, have been identified in several documents. Small quantities of picric acid were disposed of in the SDA although the specific location cannot be verified. Prior to 1970, chemicals that were no longer needed were included in contaminated RFP waste for burial. Although chemical names are not specified, explosive chemicals such as picric acid used at RFP were burned on site and would not have been placed in drums for burial.

Because the waste in Area 1 was buried nearly 40 years ago, and there have been previous floods in the SDA, the waste containers have been significantly degraded. As a result, the potential risk for any chemical reaction is expected to be significantly reduced. Therefore, EPA HWN D003 is not assigned. The waste will be observed for any unanticipated reaction during retrieval and packaging operations. In addition, potentially reactive materials (e.g., metal turnings, bottles containing liquid or solid materials, etc.) will be removed during waste retrieval and packaging operations.

3.1.3.2 Listed Hazardous Waste Numbers. Based on information regarding waste generating processes, including use of solvents in cleaning and degreasing operations and use of cyanide in electroplating operations, the draft AK summary report indicates that F-listed HWNs will apply to the waste. The F-listed solvents identified as preliminary HWNs are F001, F002, F004, F005, F006, F007 and F009.

Numerous F003-listed solvents (i.e., acetone, methanol, xylene) were used in the historical processes that generated the wastes in Pit 4. F003-listed solvents are listed solely for ignitability; however, these waste streams do not exhibit the characteristic of ignitability and are, therefore, not assigned an F003 HWN. The absence of ignitable liquids will be verified during retrieval and packaging activities.

An evaluation of commercial chemical product disposal is presented in the draft AK summary report. Limited instances of commercial chemical product disposal were identified in the AK review. For example, documentation does identify the possible disposal of potassium or sodium cyanide pellets, disposal of a resin hardening agent (i.e., 10 to 20 gallons of 4,4-methylene-bis, 2-chloroaniline), and disposal of mercury bottles. If encountered, these containerized chemicals will be removed from the targeted waste stream during repackaging and managed separately. With the exception of these examples, no other information was available to identify the specific chemicals disposed. Without this specific

knowledge, it is concluded that additional P-and U-listed HWNs cannot be assigned. Therefore, based on the evaluation and the planned repackaging steps, assignment of U-and P-listed HWNs to the retrieved waste from the designated retrieval area is not necessary. Assignment of listed waste codes to any individual containers of chemicals that require removal from the waste stream may be necessary, pending assessment of information collected to characterize the chemical following removal. Storage of these items is discussed in Section 3.1.3.5 below.

3.1.3.3 Pit 4 Retrieval Area Wastes. As described earlier, retrieved wastes are considered to consist of waste (i.e., sludges and debris) that was originally disposed of in Pit 4 and soils (i.e., interstitial and underburden). Although the term "sludge" is used for some of the waste, it is partially a misnomer. The "sludges" associated with AR Project waste are expected to contain only absorbed moisture, as opposed to the common use of the term "sludge," which invokes the idea of free standing or separable liquid. The Pit 4 retrieval area is known to contain sludges from the RFP. Characterization information available about the processes that generated these sludges indicates that several listed and characteristic HWNs are potentially applicable. TW in the Pit 4 retrieval area includes Series 741 and 743 sludge, graphite, filters, and roaster oxide waste streams. These waste streams are described in Table 1.

It will be difficult to separate interstitial soils from wastes due to commingling in the pit. Because of this fact, interstitial soils will be processed as TW or NTW, depending on the type of waste with which the soil is commingled. Each waste stream is assigned HWNs based on historic knowledge as shown in Table 1. Because of commingling, it is necessary to assume that all waste streams have come in contact with each other; therefore, all of the HWNs from the waste streams will be combined and assigned to all of the waste, with the exception of the D001, D002, and D003 HWNs.

Underburden soils will generally remain in place and are not considered wastes.

3.1.3.4 Toxic Substance Control Act Assumptions. PCBs have been recognized as a possible chemical constituent within the RFP TW streams, but definitive information on the presence or concentration of the PCBs has not been available. The Glovebox Excavator Method Project characterization results have been analyzed for PCBs; analytical data collection was designed to characterize the average PCB concentration within the overall project waste stream retrieved. It is noted that the general waste types within the project retrieval area and the designated Pit 4 retrieval area are similar. Based on the analysis performed, the project waste 90% upper confidence limit (UCL90) PCB concentration is 37 ppm. Of course, this is below the PCB regulatory threshold of 50 ppm or greater. However, analysis of the data indicated that a significant number of the samples analyzed did contain PCBs, some at elevated concentrations. Based on this, and differences in the composition of the waste streams to be generated (i.e., reduced interstitial soil quantity), the presence of PCBs in the AR Project waste inventory at or above the Toxic Substances Control Act (TSCA) regulatory threshold cannot be ruled out without analytical verification. Consequently, a project storage assumption is that a portion of the waste population requiring storage exhibits PCB concentrations $\geq$ 50 ppm.

As described in Section A-4 of the *Action Memorandum for Accelerated Retrieval of a Described Area within Pit 4* (Burton 2004), a risk-based storage approval, in accordance with 40 CFR 761.61(c), has been documented for the project. Onsite CERCLA storage of project waste streams will be performed in accordance with the provisions of the risk-based approval documented as Appendix A to the Action Memorandum and consistent with appropriate INEEL waste MCPs. In the event that analytical data is collected that shows the wastes are not contaminated with PCBs at concentrations of 50 ppm or greater, the provisions of the risk-based approval will no longer require implementation, and project waste management practices may be modified accordingly. Further, it is noted that implementation of the risk-based storage approval will not be relevant to storage of wastes within WMF-628. WMF-628 is designed and operated to satisfy the requirements of TSCA for PCB storage.

3.1.3.5 Special Case Waste and Prohibited Items. As discussed above, a number of items are contained in the waste that are prohibited from disposal at WIPP. These include unabsorbed liquids, compressed gases, and bottles of chemical reagents. Visual examination of the waste is performed to ensure prohibited items are not shipped to WIPP. The retrieved waste is placed in a tray and brought to

the drum packaging stations within the airlock where it is visually examined for prohibited items. Any liquids in TW are absorbed using suitable absorbents, and any other prohibited items are removed. A visual examination record is generated to document the absence of prohibited items in the repackaged waste.

Bottles containing free liquids will not be allowable for return to the pit without regulatory agency approval and appropriate risk-based justification. Because of the unknown nature of the bottles (i.e., AK information is generally not able to identify the specific chemicals that were disposed), the bottles present safety and operational hazards. If identified in the drum packaging stations, the bottles will be examined, characterized to the extent possible with any identifiable information (e.g., labels), and subjected to a case-by-case management review by appropriate operations and ES&H personnel to determine appropriate handling precautions and procedures. INEEL MCPs that address management of unknowns may be followed for management and storage of any such chemicals that are removed from the drum packaging stations. Unknown chemicals would require storage as if incompatible with other wastes or materials (i.e., separation by distance/barrier will be required to store unknowns).

Compressed gas cylinders, if identified in the drum packaging station, are not WIPP eligible, and may be returned to the original excavation. Aerosol cans may be vented in the drum packaging stations or returned to the pit.

Preliminary planning has identified two potential locations for management of these special-case items. The first option involves storage within portable storage units located within the SDA at RWMC that are registered as CERCLA storage areas. These units are designed for storage of RCRA and TSCA regulated wastes and include built-in secondary containment for storage of liquids. The second option involves management of the items within the RE, although the details of this option remain to be developed before retrieval operations are commenced. Final management planning for the special case items will be developed on a case-by-case basis, depending upon the characterization information collected at the time of waste generation.

3.1.4 Waste Segregation

Construction waste streams generally will not be hazardous waste, but rather will be industrial waste (IW) (i.e., nonhazardous solid waste) and will typically not require RCRA- or TSCA-compliant storage. Some IW generated during construction (e.g., office waste) can be disposed of in cold-waste (i.e., nonradioactive) receptacles located on the construction site before final disposition in accordance with the INEEL WAC (DOE-ID 2002b). If hazardous waste is generated, it will be characterized on a case-by-case basis and evaluated for treatment and disposal.

Container storage areas and containers for collection of waste will be clearly labeled to identify waste type. When operators receive retrieved waste from the trench, they will handle and inspect the retrieved waste, during which WIPP-trained personnel also will physically characterize the retrieved waste via visual inspection. Characterization efforts for retrieved wastes will be dictated by the *WIPP/RCRA Field Sampling and Analysis Plan* (Arbon 2004[c]). Characterization includes a documented physical description of the retrieved waste. Once the retrieved waste has been containerized and the container sealed, the container will be weighed and assayed, then the container will then be transferred to CERCLA storage. The container location in CERCLA storage will be noted and added to the Integrated Waste Tracking System (IWTS). Sample analyses results will be included in the IWTS. This information, along with other relevant information entered into the IWTS, will be used by the INEEL for dispositioning and transporting waste.

Based on analysis to date, TW intended for repackaging will not require segregation/separation due to incompatibility (Dick and Burton 2002). A majority of the retrieved wastes are assumed to be commingled because a lack of container integrity was evident during the Glovebox Excavator Method

c. Arbon, Rod, 2004, *WIPP/RCRA Field Sampling and Analysis Plan for the Accelerated Retrieval Project for a Described Area within Pit 4*, ICP/EXT-04-00329, Rev. 0, Draft, Idaho Completion Project.

Project retrieval. If visual observations identify waste needing segregation/separation, then appropriate waste handling and storage procedures will be developed through consultation among operations and ES&H personnel, based on relevant characterization information. Further, project-specific chemical compatibility verification for the wastes in the designated retrieval area is being prepared and will be finalized before waste-generating activities are commenced.

Separation of wastes to facilitate operations will occur as deemed appropriate by the operations manager.

3.1.5 Waste Minimization

Each CERCLA remediation project is unique with most having short durations. The concurrent development of this plan and AR Project design phase is an example of how waste minimization is evaluated closely before operation to evaluate and consider options that will reduce the overall waste generation through the life cycle of the AR Project.

AR Project waste minimization will be accomplished through design and planning to ensure efficient operations that will not generate unnecessary waste. As part of required prejob briefings, emphasis will be placed on waste reduction philosophies and techniques, and personnel will be encouraged to continuously attempt to improve methods for minimizing generated waste. A more complete discussion of waste minimization for environmental restoration projects is contained in *U.S. Department of Energy-Idaho Operations Office, Idaho National Engineering and Environmental Laboratory Interim Pollution Prevention Plan* (Janke 2000). Waste minimization practices that will be used include source reduction, recycle, and reuse, disposal and treatment, best management practices, and training.

3.1.6 Waste Stream Identification

This section provides descriptions of the waste streams expected to be generated during AR Project operations. Succeeding sections address waste packaging, labeling, storage, transportation, and potential waste disposal options. Table 1 provides a summary of the waste streams and estimated volumes of the TWs contained in the Pit 4 retrieval area. Appendix C provides a summary of the expected wastes generated during the removal action.

3.1.6.1 Secondary Waste. Secondary waste includes the waste generated during the onsite construction of buildings and equipment, waste generated during the initial removal of overburden soil, waste associated with characterization sampling, decontamination and immobilization of residual contamination, waste associated with routine radiological monitoring of confinement and maintenance and inspection of equipment, waste generated during the DD&D of building structures, and processes and waste generated from support activities (including operations and maintenance activities) related to retrieving, processing, sampling, and packaging of the Pit 4 retrieved wastes. Examples of secondary waste include waste associated with routine decontamination activities and PPE, administrative area and support service waste, used equipment and filters, and other similar waste generated during operations, maintenance, and sampling activities.

3.1.6.2 Retrieved Waste. Pit 4 retrieved waste consists of TW wastes originally disposed of within Pit 4, including some commingled soils. Approximately 12,000 55-gal drums of waste is estimated to be removed during the AR Project. This amount includes both TW, commingled interstitial soils, along with some intermixed NTW. Pit 4 wastes targeted for retrieval are listed in Table 1.

The waste and contaminants located in Pit 4 retrieval are described in Section 1. The project area is presented in Figure 2. Records show that this area contains primarily RFP and some waste from INEEL generating facilities. Table 1 provides a summary of the waste containers and items to be encountered during Pit 4 waste retrieval.

3.1.6.3 Associated Interstitial Soils. Interstitial soils, like overburden soils, originated in the spreading areas and were placed among and atop the waste during burial. A layer of soil, designated as underburden, was placed over the basalt before burial of the waste in the pit. Little information is currently available about the chemical or radiological contamination levels within the interstitial soils and underburden. It is initially assumed that the interstitial soils are commingled with retrieved wastes and will be associated with contamination consistent with management as mixed transuranic (MTRU) waste. It is initially assumed that the HWNs from the retrieved waste will apply to the adjacent associated interstitial soils. Overburden soil has not contacted the waste; therefore, no HWN will apply to the overburden soil.

3.2 Container Management

The following subsections describe the management of waste in containers during onsite CERCLA storage, transportation, and disposal. Note that storage of waste in WMF-628 must be in compliance with the provisions of the HWMA/RCRA permit that applies to WMF-628.

3.2.1 Packaging

Packaging of Pit 4 retrieved waste will be in accordance with operation design details and procedures and the applicable WAC (see Appendix B). Packaging will be in compliance with the following:

- INEEL WAC
- RCRA regulations found in 40 CFR 264 Subpart I, "Use and Management of Containers"
- TSCA requirements found in 40 CFR 761.65, if required
- Receiving TSD facility WAC
- Applicable U.S. Department of Transportation (DOT) regulations for Type 7A packages.

The INEEL Waste Generator Services (WGS) along with the Packaging and Transportation organization will be consulted before waste is generated to identify specific types of containers to be used for the anticipated waste. Typical containers include 55-gal steel UN1A1 and UN1A2 drums, 85-gal overpack containers, wooden or metal boxes measuring $1.2 \times 1.2 \times 2.4$ m ($4 \times 4 \times 8$ ft) or $0.6 \times 1.2 \times 2.4$ m ($2 \times 4 \times 8$ ft), and soft-sided bags. Roll-off containers and cargo containers will be used for secondary waste. Additional containers may be used on a case-by-case basis.

3.2.2 Labeling

Containers will be labeled consistent with the Waste Acceptance Criteria in Appendix B. Each container will be labeled with a barcode label generated from the IWTS database. Additional CERCLA waste labels may be affixed to containers as required. Container labels will be placed where clearly visible during storage and shipment. Drums will be labeled, at a minimum, on one side. Boxes will be labeled, at a minimum, on two sides of the container. Radiation labels will be completed and placed on each container as required by the RadCon Manual. Labels for PCBs will comply with TSCA regulations and will be applied to containers when necessary. In preparation for shipment, other information will be placed on the containers such as applicable DOT labels, manifest number, gross weight, and the complete name and address of the shipper, as required. Soft-sided bags used in the area of the trench for consolidating waste will not require labeling, if the bags are not removed from the RE. Additional label requirements, based on the receiving facility WAC, will be utilized as required (e.g., 3 labels per drum at an equal distance around the drum, approximately 120^{o} apart).

3.2.3 Storage and Inspection

For CERCLA storage, the waste will be stored within one of the CERCLA storage areas. The design will include aisle space for inspection activities and container movement, as required. Structures will be constructed to prevent washout from storm water. The wastes stored will primarily consist of solid debris items, including a mixture of interstitial soils and retrieved wastes, PCB-contaminated waste (if encountered); low-level waste (LLW); and TRU-contaminated waste. Inspections are conducted as described in Appendix A.

Waste storage in WMF-628, a RCRA-permitted Type II storage module within the RWMC TSA, may also occur as part of the project work scope and in particular, in association with WIPP CCP characterization and waste certification activities. Waste storage within WMF-628 will be in accordance with the provisions of the RCRA permit and the applicable waste acceptance criteria (see Appendix B).

3.2.4 Transportation

The CERCLA remediation waste generated as a result of AR Project activities will be transported in accordance with requirements identified in the INEEL WAC, appropriate DOT regulations, RCRA regulations, and company procedures (MCP-2669, “Hazardous Waste Shipping,” and MCP-2670, “Motor Carrier Operations”) as necessary. If shipment of CERCLA remediation waste is necessary during the project, WGS and Packaging and Transportation organization personnel will be responsible for performing those activities. IW transported to the INEEL Landfill Complex can be transported by the waste generator, landfill personnel, or WGS personnel.

3.2.5 Disposal

Disposal of each type of waste stream generated during the AR Project will be accomplished in accordance with all applicable requirements found in state and federal regulations. Disposal options for each type of expected waste stream are described in Figures 7 and 8. Figure 7 displays the treatment and disposal options for radioactive waste, and Figure 8 displays the treatment and disposal options for nonradioactive waste.

All waste will undergo characterization to ensure that the requirements of the WAC for the appropriate disposal facility are met before shipment to the disposal facility. A list of potential disposal facility options is shown in Figure 7. If waste is generated that cannot be sent to any of the listed disposal facilities discussed in the above paragraph, other treatment or disposal options will be investigated to determine the proper treatment and disposal route for this waste. In general, disposal of secondary and non-WIPP eligible waste streams will be pursued as soon as practical. Evaluation of potential offsite disposal options for waste that is not WIPP eligible is being pursued by WGS personnel at this time. Preliminary indications are that disposal of these wastes (i.e., wastes not eligible for WIPP disposal) will have been accomplished by the end of FY-06.

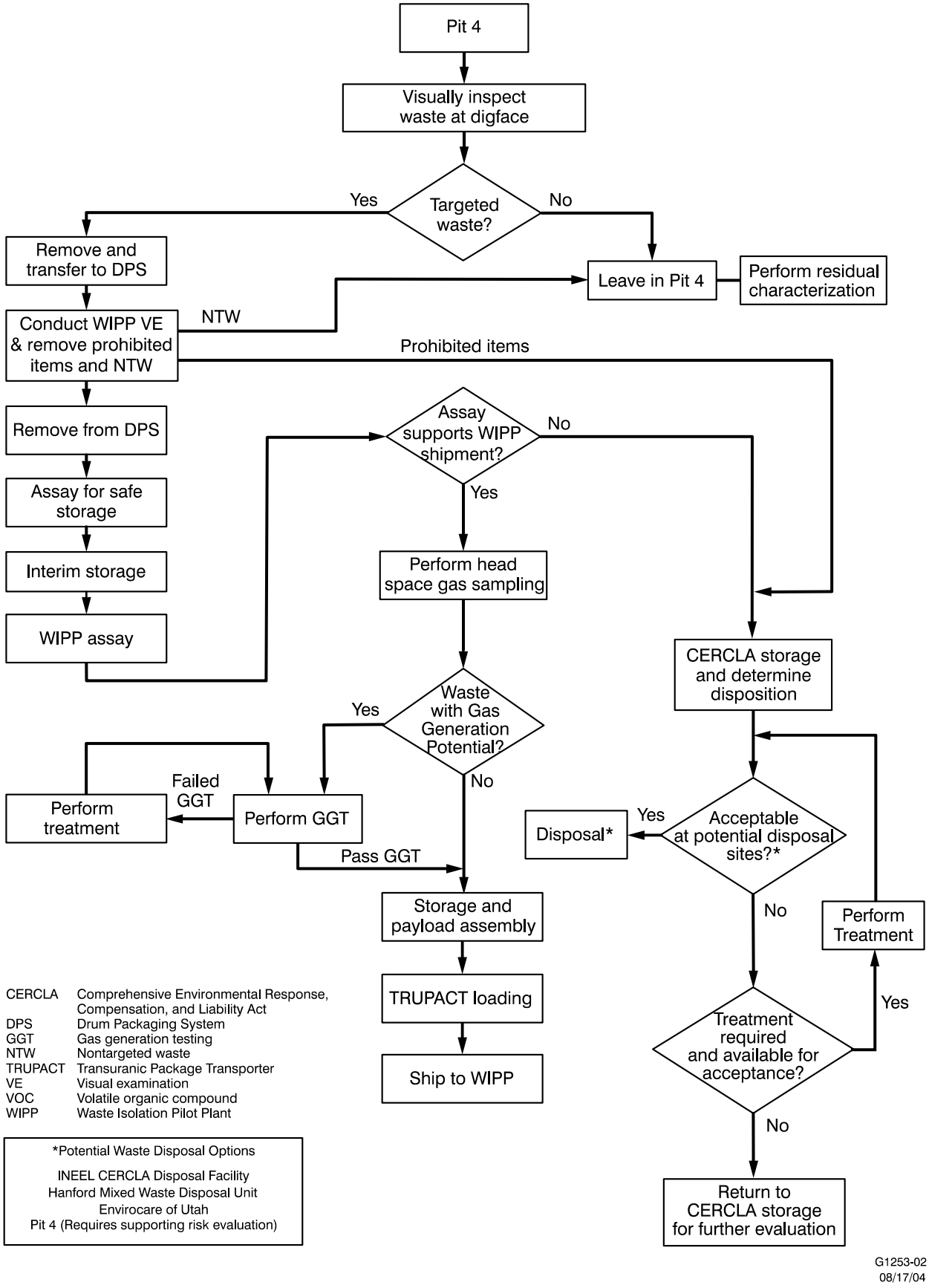
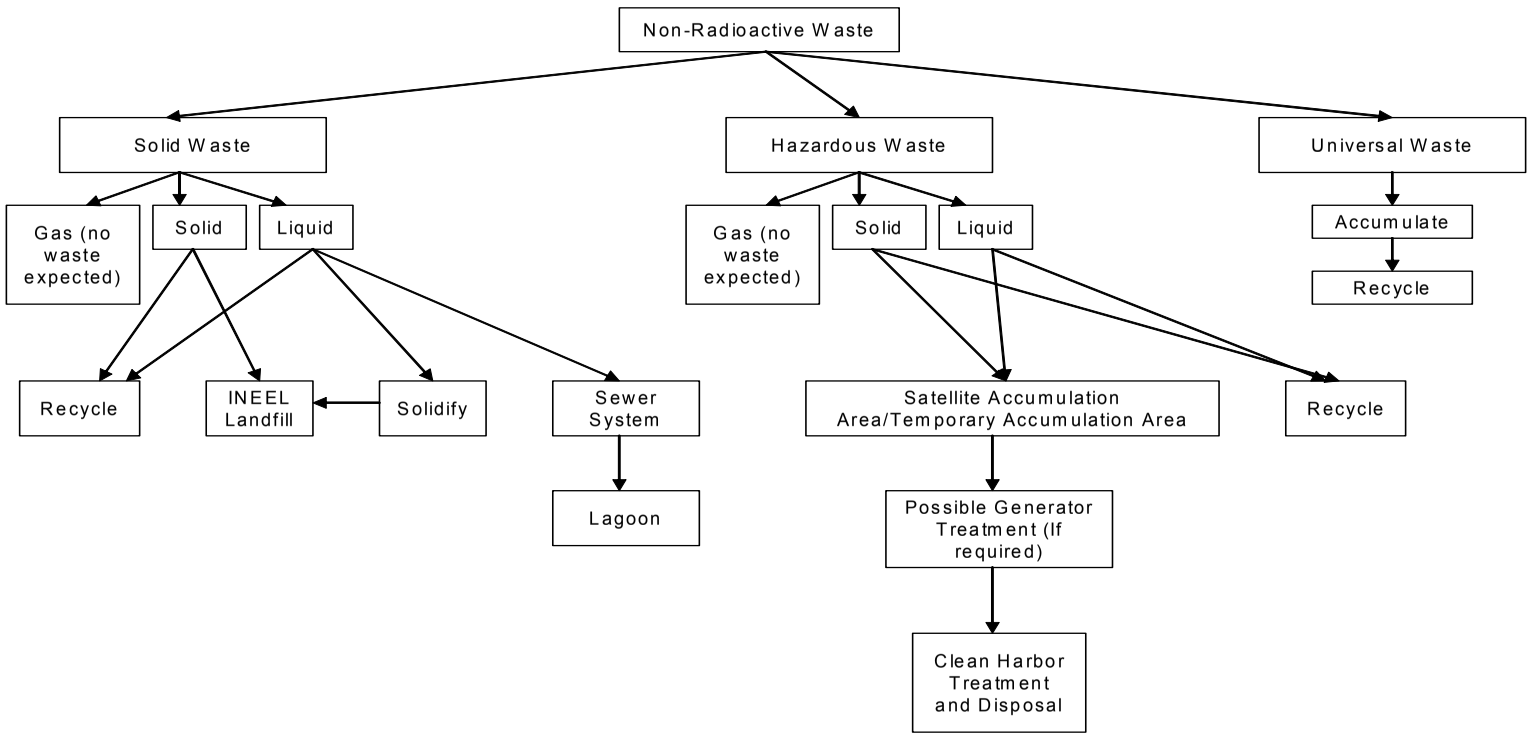


Figure 7. AR Project conceptual radioactive waste disposition process flow.

NOTE: *The "Potential Waste Disposal Options" include those facilities that are expected to be sent waste profiles for treatment/disposal approval; these are not sites that necessarily can accept the waste.*



Solid waste includes nonradioactive, nonhazardous solid waste that can be sent to the INEEL solid and industrial waste landfill. Hazardous waste includes waste that is designated hazardous by EPA regulations 40 CFR 261.3 and regulated under RCRA. Hazardous waste requires disposal at a RCRA-regulated landfill. Universal waste is hazardous waste (e.g., lead-acid batteries, fluorescent bulbs, metal halide lamps, and mercury thermostats) that is governed by the universal waste management standards within 40 CFR 273.

Figure 8. Conceptual nonradioactive waste disposal flow.

3.3 Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA requires that remedial actions, implemented at CERCLA sites and that compel attainment of ARARs during removal actions to the extent practicable, must meet any federal or more stringent state environmental standards, requirements, criteria, or limitations determined to be ARARs. Applicable requirements are those cleanup standards, criteria, or limitations promulgated under federal or state law that specifically address the situation at the CERCLA site. A requirement is applicable if the environmental standard shows a direct correspondence when objectively compared with the conditions at the site.

If a requirement is not legally applicable, the requirement is evaluated to determine whether it is relevant and appropriate. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not applicable, address problems or situations sufficiently similar to the circumstances of the proposed response action and are well-suited to the conditions of the site. The criteria for determining the relevance and appropriateness are listed in 40 CFR Part 300.400(g)(2).

In accordance with EPA guidance, ARARs generally are classified into three categories: chemical-specific, location-specific, and action-specific requirements. These classification categories were developed to help identify ARARs, some of which do not fall precisely into one group or another. These categories of ARARs are defined as follows:

- **Chemical-specific ARARs** includes those laws and requirements that regulate the release to the environment of materials possessing certain chemical or physical characteristics or containing specified chemical compounds. These requirements generally set health or risk-based concentration limits or discharge limitations for specific hazardous substances. If, in a specific situation, a chemical is subject to more than one discharge or exposure limit, the more stringent of the requirements should generally be applied.

- **Location-specific ARARs** are those requirements that relate to the geographical or physical position of the site, rather than the nature of the contaminants or the proposed site remedial actions. These requirements may limit the placement of remedial action and may impose additional constraints on the cleanup action. For example, location-specific ARARs may refer to activities in the vicinity of wetlands, endangered species habitat, or areas of historical or cultural significance.

- **Action-specific ARARs** are requirements that apply to specific actions that may be associated with site remediation. Action-specific ARARs often define acceptable handling, treatment, and disposal procedures for hazardous substances. These requirements are triggered by the particular remedial activities that are selected to accomplish a remedy. Examples of action-specific ARARs include requirements applicable to landfill closure, wastewater discharge, hazardous waste disposal, and emissions of air pollutants.

A requirement may not meet the definition of ARAR as described above, but still may be useful in determining whether to take action at a site or to what degree action is necessary. This can be particularly true when there are no ARARs for a site, action, or contaminant. Such requirements are called to-be-considered (TBC) criteria and are defined at 40 CFR 300.400(g)(3). Chemical-specific TBC requirements are applied in the absence of ARARs or when the existing ARAR is not sufficiently protective to develop cleanup levels. TBC materials are guidance issued by federal or state governments that are not legally binding but that may provide useful information or recommended procedures for remedial action. Although TBCs do not have the status of ARARs, they are considered together with

ARARs to establish the required level of cleanup for protection of human health and the environment. For a detailed description of the ARARs and TBCs for this RAP, see Appendix A.

3.4 Emergency Planning

An Emergency Plan/Contingency Plan (EP/CP), "INEEL Emergency Plan Resource Conservation and Recovery Act (RCRA) Contingency Plan" (PLN-114), has been prepared for the INEEL. The EP/CP addresses the actions that are taken to protect human health and the environment in the event of an emergency. The emergency response section of the HASP defines the roles and responsibilities of AR Project operations personnel during an emergency. Such an emergency could be within the AR Project operations area, at the RWMC, or a Sitewide emergency. The EP/CP provides information for evacuations or shelter-in-place actions, establishes an emergency response organization, and identifies the lines of communication. Once the INEEL plan is activated, AR Project operations personnel will follow the direction and guidance communicated by the emergency coordinator. Additionally, the EP/CP directs the post-emergency recovery. This EP/CP is available to, and will be utilized by, the AR Project. The RCRA EP/CP covers alarms and communications equipment, emergency equipment, and fire protection equipment for the RWMC. The INEEL Fire Department provides emergency fire fighting support and emergency medical support. The CFA dispensary and ambulance are available for AR Project personnel. Firewater is available at the RWMC and consists of two approximately 250,000-gal water storage tanks. Additionally, there will be an Appendix L (per MCP-3475) to the EP/CP that will address AR Project-specific items.

3.5 Health and Safety

Construction and operation of the AR Project facilities will present physical, chemical, and radiological hazards to personnel. Identification and mitigation of these hazards is imperative to prevent injury or exposure to personnel conducting these activities. The primary objective of this section is to identify existing and anticipated hazards based on project operations and to provide controls to eliminate or mitigate these hazards.

Personnel may be exposed to industrial safety hazards or to radiological, nonradiological, and physical agents while conducting project operations. Designed engineering controls will be implemented along with work procedures, real-time monitoring of selected contaminants, and AR Project-specific hazard training to further mitigate potential hazards and exposures. Formal preplanning (e.g., job walk-down, completion of the hazard profile screening checklists, and prejob briefing checklists), job safety analyses, and other work controls will be written based on the hazards identified in the AR Project Health and Safety Plan (HASP) (INEEL 2004), TPRs, "Integrated Work Control Process" (STD-101), work packages, and operational conditions. These documents will specify specific operational hazard mitigation measures.

3.5.1 Records Management.

The ICP Administrative Record and Document Control office organizes and maintains data and reports generated by field activities. The Administrative Record and Document Control office maintains a supply of all controlled documents and provides a documented system for the control and release of controlled documents, reports, and records. Copies of project plans; the project HASP; the quality program plan; the Quality Assurance Project Plan for WAGs 1, 2, 3, 4, 5, 6, 7, 10 and inactive sites (DOE-ID 2000); and other documents pertaining to these operations are maintained in the project file by the ICP Administrative Record and Document Control office. Controlled procedures for the RWMC and AR Project will be issued, controlled, and maintained in accordance with "Creating, Modifying, and

Canceling Procedures and Other DMCS-Controlled Documents" (MCP-135) and applicable RWMC or project supplemental MCPs.

All additional project records will be maintained in accordance with applicable federal and state procedures, companywide manuals, and project-specific supplemental procedures.

3.6 Sampling and Analysis

This section provides a description of the sampling and analysis strategies to be used by the AR Project.

3.6.1 Sampling Requirements for WIPP Characterizations

The *WIPP/RCRA Field Sampling and Analysis Plan* (Arbon et al. 2004) for characterization of retrieved TRU homogeneous solids and soil/gravel waste forms will be completed and approval obtained from the U.S. Department of Energy Carlsbad Field Office. Approval of this plan and incorporation into operating procedures will be needed prior to startup of waste retrieval. (Removal of overburden and PCS may occur prior to approval of the sampling plan.) This sampling plan will be updated in FY-05 to reflect analytical results from sampling efforts in the initial 0.1 ha (1/4 acre) and to define sampling locations for the next 0.1 ha (1/4 acre) to be retrieved.

Sampling and analysis consists of total analysis for VOCs, semivolatile organic compounds, and metals (antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, nickel, selenium, silver, thallium, vanadium, and zinc), as required by WIPP.

3.6.1.1 Excavation Coordinates. During excavation, activities RCRA/WIPP samples will be taken to support WIPP acceptance. X, y, z coordinates will be used to identify the sampling location and be recognized in the daily dig plan. In an effort to document the location of RCRA samples retrieved from within the excavation site and to maintain an even grade at a specified depth, the project will use a hanging-ball plumb (or other appropriate locating device) from the excavating bucket in concert with visual marks along the perimeter of the excavation site. The hanging-ball plumb will identify the location of the excavating bucket, while visual marks along the excavation site perimeter provide the position of the excavator within designated excavation area. Using the horizontal, vertical, and excavator location coordinates for each bucket full of waste; this project's sampling data could be correlated with the location of waste in the pit. The operators will keep track of each scoop of sampled waste by recording the scoop location (i.e., north, south, depth). The scoop location will then be correlated to the drum number in which the waste is packaged. Finally, the scoop locations and the drum numbers are correlated to the sample numbers.

3.6.1.2 Sample Locations. The approximate dimensions of the Pit 4 retrieval area are 74.1 m × 38.4 m × 3.6 m (243 ft × 126 ft × 12 ft) deep, or an area of approximately 0.2 ha (1/2 acre). Excavation will be accomplished in two phases. Phase I is the excavation of the first half of the described area by January 31, 2005. This is approximately 0.1 ha by 3.6 m (1/4 acre by 12 ft) deep . For RCRA purposes (WIPP acceptance), the 0.1 ha (1/4 acre) area in each retrieval phase will be sampled separately.

Sample locations will be identified by portioning the described area within each retrieval phase into 192 cubical volumes and randomly selecting volumes for sampling. This equates to three layers approximately 4 ft thick with each layer containing 64 cubical volumes in each defined area. Thirty out of the 192 cubical volumes in each defined area will be randomly selected with the constraint that each layer contains 10 randomly selected cubical volumes. In the event that a randomly selected sample location

contains material that cannot be sampled (i.e., debris), then the sampling plan has provisions for selecting an alternate grid location.

3.6.1.3 Sample Collection. As the location for sampling is approached, the waste zone will be evaluated by the heavy equipment operator and support personnel viewing the digface via closed-circuit television to determine the material type (e.g., homogeneous solids [inorganic or organic waste forms] and soil/gravel or debris [combustibles, metals, glass]). With the exception of all debris materials, the waste will be excavated for sampling, regardless of whether it is a TW form. The excavator bucket will be used to collect approximately 0.14 m^3 (5 ft^3) of material with the x, y, z coordinates located roughly in the center of the cubical volume. The waste will be placed in a tray and tracked from the excavation site to the packaging station, at which point chain-of-custody commences and sample collection activities will begin. Tracking, at a minimum, will include the x, y, z collection location and the date.

Once the material for sampling arrives in the drum packaging station, nondebris waste with dimensions of < 10.2 cm (< 1/4 in.) will be identified for sampling. Pre-labeled sample bottles and disposable, cleaned utensils will be used to collect the samples. VOC sample vials will be collected first, then the metals and semivolatile organic compounds sample. Chain-of-custody commences upon collection of the samples.

Following sample collection, the samples will be transferred out of the drum packaging station, any necessary preservatives added (e.g., cooling to $4^oC \pm 2^oC$), the chain-of-custody will be maintained, and the samples will be kept under physical custody. Samples will be shipped to the laboratory in sufficient time to allow all analyses to be completed within holding times. TW remaining in the tray will be processed through the drum packaging station, and NTW will be consolidated for relocation in the retrieval area.

3.6.2 Sampling of NTW Remaining in Pit 4 and Underburden

A draft document, *Data Quality Objectives for the Accelerated Retrieval Project for a Described Area within Pit 4*, is currently being developed to define data quality objectives for characterization of the NTW that will remain in the pit following retrieval and to characterize the underburden soils. Once completed, the DQO document will be reviewed by EPA and DEQ to ensure consensus on the data collection proposed. The draft data quality objectives associated with this sampling were determined at a meeting held with DEQ, EPA, and DOE representatives on July 19, 2004. In that meeting, the DQO process was performed to identify agreed-upon objectives for characterization of the NTW remaining in Pit 4 after retrieval and characterization objectives for the underburden. Samples of the NTW remaining in Pit 4 and the underburden will be collected. The underburden and the NTW will be sampled and statistically evaluated as two separate populations. Sampling details and procedures controlling the characterization activity will be presented in a Sampling and Analysis Plan that will be submitted to the agencies for review.

4. NTCRA SCHEDULE

Table 2 is a working schedule for the NTCRA.

Table 2. NTCRA schedule.

Item	Description	Start Date	End Date
1	Design	December 1, 2003	June 30, 2004
2	Procurement	January 1, 2004	June 30, 2004
Construction			
3	RE Construction	March 15, 2004	September 30, 2004
4	SE Construction	October 4, 2004	January 31, 2005
5	Mechanical/Electrical/Instrumentation Completion	June 14, 2004	September 30, 2004
Operations			
6	Procedures	March 1, 2004	October 7, 2004
7	Training and Readiness	May 24, 2004	October 7, 2004
8	MSA	October 11, 2004	October 17, 2004
9	Contractor ORR	October 18, 2004	October 25, 2004
10	DOE ORR	October 26, 2004	October 31, 2004
11	Retrieval Operations	November 6, 2004	September 30, 2005

5. REFERENCES

15 USC § 2601 et seq., 1976, "The Toxic Substances Control Act (TSCA) of 1976," *United States Code,* October 1976.

29 CFR 1910, 2004, "Occupational Safety and Health Standards," *Code of Federal Regulations*, Office of the Federal Register.

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Appendix A

Applicable or Relevant and Appropriate Requirements

Appendix A

Applicable or Relevant and Appropriate Requirements

The purpose of this appendix is to identify the ARARs for the AR (Accelerated Retrieval) Project NTCRA, Alternative Two—Focused Retrieval, described in the RAP for the AR Project at Pit 4 within the RWMC. As is appropriate for a CERCLA action, only the substantive provisions of the cited ARARs require implementation for the project. Specific ARAR citations and implementation information are provided in Table A-1. Storage of retrieved waste streams may be performed in the CERCLA SE or be performed alternatively within the RCRA-permitted storage module, WMF-628, located within the RWMC TSA. Storage of AR Project waste within WMF-628 will require compliance with the requirements of the INEEL HWMA/RCRA Permit, for RWMC (i.e., Volume 5) rather than the RCRA storage ARARs identified in this appendix. The waste acceptance criteria for storage of AR Project retrieved waste within both the SE and WMF-628 are located in Appendix B.

The ARARs implementation for a CERCLA removal action is prescribed by the National Contingency Plan (40 CFR 300). Removal actions must "to the extent practicable considering the exigencies of the situation, attain ARARs under federal environmental or state environmental or facility siting laws" [40 CFR 300.415(j)]. The same subsection of the National Contingency Plan further states, "In determining whether compliance with ARARs is practicable, the lead agency may consider appropriate factors, including (1) the urgency of the situation; and (2) the scope of the removal action to be conducted." Consideration of these factors is discussed in the following sections relative to the identification of appropriate ARARs for this NTCRA.

CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The chemical-specific ARARs identified in Table A-1 for this NTCRA are primarily limited to ARARs controlling air emissions from the site. Examples of chemical-specific ARARs that will be attained through the NTCRA include the requirements of Idaho's toxic air pollutant standards for releases of carcinogenic and other hazardous chemicals to the ambient air. For radionuclide emissions, the requirements of "National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities" (40 CFR 61, Subpart H) will apply. The provisions of Subpart H limit the effective dose equivalent from all DOE INEEL facilities to a level of 10 mrem/year.

It is noted that the chemical-specific ARARs of the Idaho groundwater quality rules and associated maximum contaminant levels (Idaho Administrative Procedures Act [IDAPA] 58.01.11) are anticipated to be ARARs for the comprehensive OU 7-13/14 remedy but are not relevant and appropriate to the limited scope of this NTCRA. This conclusion is based on the limited scope of the proposed NTCRA in the context of the overall OU 7-13/14 program. As stated in the CERCLA Compliance with Other Laws Manual: Interim Final, "…a removal action may be conducted to remove a large number of leaking drums and associated contaminated soil. In this situation, because the removal focuses only on partial control, chemical-specific ARARs for groundwater restoration would not be considered" (EPA 1988b). Other chemical-specific ARARs are presented in Table A-1.

LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Location-specific requirements that may apply to the removal action plan relate to cultural resource requirements such as those from the National Historic Preservation Act. Although the SDA is a disturbed area with prior clearance, the associated regulations are considered ARARs, and substantive provisions must be addressed in the unlikely event that archaeological remains are encountered during excavation of overburden soil.

ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Substantive RCRA generator requirements for hazardous waste identification and management are applicable to waste that is retrieved and generated as part of the removal action. Generally, it is assumed that the waste forms from RFP will be associated with various listed and characteristic HWNs based on similarity to the RFP waste stored elsewhere on the RWMC.

The requirements for container storage (40 CFR 264, Subpart I) are identified as ARARs to address the CERCLA storage of containerized waste within the AR Project area of contamination. The SE will satisfy the substantive Subpart I requirements for storage of hazardous waste as modified in this document. The container array will be modified to a dense pack array. The dense pack array allows containers to be stored 4 containers wide. This configuration provides some radiation shielding, provides for the storage of more containers in the same per storage space, and is supported by the containers generally being recently filled and generally containing no liquids. In addition to the SE, other storage areas are planned for use to store containerized secondary waste. These other areas consist of cargo containers used for the accumulation of secondary waste. The cargo containers would be 2.4 × 2.4 × 6.1-m (8 × 8 × 20-ft) units registered as CERCLA waste storage areas under INEEL MCPs and managed in accordance with the ARARs identified in this appendix. The containers will be located on the asphalt pad located adjacent to the RE (i.e., south side of the RE). The cargo containers would not store waste that is removed from the pit. The containers would be used to store solid waste streams that are eligible for short-turnaround disposal such as PPE, decontamination equipment, and wastes from routine radiological surveys.

The RCRA LDRs prohibit the placement of restricted RCRA hazardous waste in land-based units such as landfills, surface impoundments, and waste piles until treated to standards considered protective for disposal. Specific treatment standards are included in requirements. These requirements are applicable to the treatment and disposal of RCRA hazardous waste if placement of restricted waste occurs. The LDRs do not apply to materials disposed of at the WIPP based upon the WIPP Land Withdrawal Act exemption. The LDRs generally will apply to treated waste, secondary waste streams, other waste that is RCRA listed, or characteristic waste that is disposed of at off-Site treatment, storage, and disposal facilities.

The RCRA closure requirements for landfills are not considered ARARs for the limited scope of this removal action. As referenced above, the limited scope of the removal action can be considered in determining whether an ARAR is practicable for implementation in a removal action context. In the case of the proposed Alternative Two—Focused Retrieval, DOE has determined that implementation of closure ARARs is not practicable. The Area of Contamination (AOC) for Waste Area Group 7 has not been formally defined in CERCLA documentation under the *Federal Facility Agreement and Consent Order for the INEL* (Staiger 1991). For the purposes of this NTCRA, the AOC encompasses the SDA as bounded by the flood control dike that surrounds the SDA perimeter. As defined in Superfund LDR

Guide #5: *Determining When Land Disposal Restrictions (LDRs) are Applicable to CERCLA Response Actions* (Office of Solid Waste and Emergency Response [OSWER], 9347.3-05FS, 1989) an AOC is delineated by the area extent (or boundary) of contiguous contamination. Such contamination must be continuous but may contain varying types and concentrations of hazardous substances. The AOC does not include any contaminated surface or groundwater that may be associated with the land-based waste source. Accordingly, the SDA AOC designation for this NTCRA is based on the presence of a continuous plume of volatile organic contamination in the SDA subsurface. Although this continuous volatile organic contaminant plume extends beyond the SDA boundary, the AOC is limited to the confines of the SDA for the purposes of implementing this NTCRA.

Implementation of closure requirements and associated monitoring provisions is not meaningful considering the limited portion of the overall landfill (i.e., SDA) being retrieved and considering that final closure ARARs for the AR Project retrieval area and buildings will be satisfied through the OU 7-13/14 ROD or other CERCLA documentation prepared in the future (e.g., in the event subsequent removal actions are performed). It is not possible to construct a meaningful closure scenario for the retrieved area considering the scope of the retrieval being proposed and the magnitude of surrounding existing waste forms that are not addressed by the action.

The thermal treatment process to be potentially employed for treatment of VOCs will be subject to substantive ARARs as a miscellaneous unit under RCRA. As part of Subpart X implementation, additional substantive ARAR provisions deemed necessary to protect human health and the environment will be identified through consultation among DOE, DEQ, and EPA representatives as part of the removal action treatment design process. Additional ARARs for consideration include provisions of Subparts I through O and Subparts AA through CC of this part, Part 270, Part 63 Subpart EEE, and Part 146 of this chapter that are appropriate for the miscellaneous unit (i.e., thermal treatment unit) and the site-specific circumstances of the CERCLA action. These ARARs may include, but are not limited to preparing a screening level risk assessment (SLRA) work plan, a preliminary SLRA, an emissions test plan, or a final SLRA that takes the MACT standards into consideration.

The TSCA regulations of "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions" (40 CFR Part 761) governing management, characterization, storage, treatment, and disposal requirements for PCB remediation waste are applicable. Inventory information indicates that, although not expected, there is a potential for PCB contamination in the Pit 4 retrieval area waste inventory at concentrations above the TSCA regulatory threshold for PCBs (i.e., 50 ppm or greater). The TSCA storage ARARs must be satisfied for any portion of the waste population identified to contain PCBs at 50 ppm or greater. This requirement may be met through a risk-based storage approval process as is allowed by "PCB Remediation Waste" (40 CFR 761.61[c]). In the event that excavated waste-zone wastes are identified to contain PCBs > 50 ppm, the wastes will not be eligible for return to the pit without supportive risk-based documentation that proves otherwise; therefore, this waste will be placed in CERCLA storage.

The DEQ regulations for fugitive dust emissions are applicable to fugitive dust generated during remediation or construction activities. Dust suppressant (e.g., Soiltac) will be applied for fugitive dust control. In addition, DEQ visible emission standards are identified as ARARs. The requirements prohibit discharge of any air pollutant into the atmosphere from any point of emission for a period or periods aggregating more than 3 minutes in any 60-minute period that is greater than 20% opacity.

Relevant substantive requirements of "Radiation Protection of the Public and the Environment" (DOE O 5400.5) and "Radioactive Waste Management" (DOE O 435.1), which specify DOE radiation protection and management requirements, will be met as TBC requirements.

Table A-1. Applicable or Relevant and Appropriate Requirements Evaluation Summary.

Item Number	ARARs or TBC Requirements	Regulatory Citation	Type	Relevancy[a]	Implementation of ARAR Description
1	Idaho Toxic Air Pollutants	IDAPA 58.01.01.585 IDAPA 58.01.01.586	Chemical	A	Estimation of AR Project toxic air pollutant emissions is performed consistent with the process outlined in IDAPA 58.01.01.203 ("Permit Requirements for New and Modified Stationary Sources") and IDAPA 58.01.01.210 ("Demostration of Preconstruction Compliance with Toxic Standards"). Through the use of the EPA-approved computer model ISCST3, the following conclusions were made concerning compliance with the Idaho Toxic Air Pollutants requirements ("Air Emissions Evaluation for the Accelerated Retrieval Project for a Described Area within Pit 4," EDF-4692): - Particulate emissions, as a measure of nonvolatile contaminants, from AR Project activities are not expected to result in a release of any nonvolatile toxic air pollutants known to be in Pit 4 wastes in excess of IDAPA 58.01.01.585 and .586 emission limits. - The volatile contaminant of concern was determined to be carbon tetrachloride. The estimated annual emission rate of 1.95 g/s for carbon tetrachloride exceeds the screening emission level of 5.55E-05 g/s; however, the modeled ambient concentration is projected at 4.5E-01 $\mu g/m^3$, which is below the short-term, adjusted acceptable ambient concentration level of 6.7E-01 $\mu g/m^3$. It is assumed that demonstration of compliance with emission limits for carbon tetrachloride provides a demonstration of compliance with all other volatile contaminants potentially present in the AR Project waste. - The estimated cancer risks from carbon tetrachloride emissions to the public and the maximally exposed RWMC worker are 9.24E-09 and 6.52E-06 respectively. In interpreting estimates of cancer risk, CERCLA generally considers action to be warranted when risks exceed a target risk level of 1E-04.

Table A-1. (continued).

Item Number	ARARs or TBC Requirements	Regulatory Citation	Type	Relevancy[a]	Implementation of ARAR Description
2	Idaho Ambient Air Quality Standards for Specific Air Pollutants	IDAPA 58.01.01.577	Chemical	A	Estimation of AR project criteria pollutant emissions is performed consistent with the process outlined in IDAPA 58.01.01.203 ("Permit Requirements for New and Modified Stationary Sources") and IDAPA 58.01.01.203.02 ("National Ambient Air Quality Standards"). Through use of the EPA-approved computer model ISCST3, the following conclusions were made concerning compliance with the "Idaho Ambient Air Quality Standards for Specific Air Pollutants" requirements: - Uncontrolled criteria air pollutant emissions from diesel-fired fuel-burning equipment will not occur in excess of IDAPA significance levels providing that the maximum continuous fuel-burning equipment used is limited to 5,660 hr per year or less. - Unabated ambient impact from criteria air pollutant emissions, considering simultaneous operation of all fuel-burning equipment, will not cause a violation of an Idaho or National Ambient Air Quality Standard. - Potential uncontrolled toxic air pollutant emissions from fuel-burning equipment is less than IDAPA screening emission levels and/or less than IDAPA acceptable ambient concentrations.

Table A-1. (continued).

Item Number	ARARs or TBC Requirements	Regulatory Citation	Type	Relevancy[a]	Implementation of ARAR Description
3	National Emission Standards for Emissions of Radionuclides other than Radon from DOE Facilities	40 CFR 61.92 through 94, Subpart H	Chemical	A	Radionuclide emissions, the abated effective dose equivalent (EDE) for the INEEL maximally exposed individual, and the unabated EDE for the INEEL maximally exposed individual were determined using the EPA approved computer model CAP-88. It was determined that the abated EDE to the INEEL maximally exposed individual from operations associated with AR Project activities is estimated at 2.7E-02 mrem/yr, which is a factor of 370 times lower than the 40 CFR 61.92 standard of 10 mrem/yr. Per 40 CFR 61.93, sources with unmitigated potential emissions determined to equal or exceed 0.1 mrem/yr are required to be continuously monitored. Per CAP-88 modeling, the unabated EDE to the INEEL maximally exposed individual is estimated to be 5.0 mrem/yr, thus the requirement for continuous air monitoring is applicable. In accordance with 40 CFR 61.93, all radionuclides that could contribute greater than 10% of the potential EDE are required to be monitored. For the AR Project, the radionuclides requiring continuous monitoring are determined to be Am-241, Pu-239, and Pu-240. (*National Emission Standards for Hazardous Air Pollutants Radiological Monitoring Plan for the Accelerated Retrieval Project*, ICP/EXT-04-00389)
4	National Historic Preservation Act of 1966	16 USC 470 et seq., 2002	Location	RA	The SDA is identified as a disturbed area with prior clearance; therefore, it is expected that ARARs associated with the National Historic Preservation Act will not require implementation. In the event that archaeological remains are encountered during overburden removal, specific requirements will be evaluated to determine the appropriate action required to comply with the National Historic Preservation Act through coordination with INEEL cultural resources office personnel **NOTE:** *None was identified during the overburden removal performed by construction completed the week of May 17, 2004.*
5	Idaho Control of Fugitive Dust Emissions	IDAPA 58.01.01.650 IDAPA 58.01.01.651	Action	A	Control of fugitive dust emissions during construction and operational activities is controlled via the use of dust suppressant or water, as needed, to control emissions below a particulate matter of 10 microns based on an significant emission limit of 15 tons/yr.

Table A-1. (continued).

Item Number	ARARs or TBC Requirements	Regulatory Citation	Type	Relevancy[a]	Implementation of ARAR Description
6	Idaho Visible Emissions	IDAPA 58.01.01.625	Action	A	All sources of emissions for the AR Project will be evaluated, and opacity readings will be performed as required.
7	HWD	IDAPA 58.01.05.006 (40 CFR 262.11)	Action	A	An HWD will be performed during retrieval activities for retrieved waste primarily through visual examination and AK. Sampling and analysis will be performed per an established plan. An HWD, performed by WGS, for secondary waste will be performed through AK of the waste with which the secondary waste has come in contact. Sampling and analysis will be performed, if required.
8	Standards for Owners and Operators of TSD Facilities—Use and Management of Containers	IDAPA 58.01.05.008 (40 CFR 264, Subpart I)			(See items that follow.)

Table A-1. (continued).

Item Number	ARARs or TBC Requirements	Regulatory Citation	Type	Relevancy[a]	Implementation of ARAR Description
8a	Condition of Containers	IDAPA 58.01.05.008 (40 CFR 264.171)	Action	A	As noted previously, all waste will be in new containers. Weekly inspections of CERCLA storage areas will be performed in accordance with INEEL MCPs. A modified inspection approach is required for CERCLA wastes stored in a modified dense pack arrangement as discussed directly below. The following requirements apply only to wastes stored in a modified dense pack arrangement in the CERCLA SE: A weekly inspection for leaks and spills will be performed by an inspector walking around the perimeter of the container rows in the CERCLA SE. Additionally, weekly radiological surveys (e.g., swipes, instrument monitoring) will be performed on any suspected leak/spill or any container observed with damage that could impact container integrity. If leaks/spills and/or radiological contamination are found, then corrective action will be performed on a timely basis. A quarterly inspection will be performed by visually inspecting for any liquid present on or near the containers and for signs of defective, visibly pitted, metal fatigued, or deteriorated containers. This inspection will be performed around the perimeter of the container rows and through each aisle in between the rows of containers.
8b	Compatibility of Waste with Containers	IDAPA 58.01.05.008 (40 CFR 264.172)	Action	A	Containers used in all CERCLA storage areas will be compatible with the types of waste managed.

Table A-1. (continued).

Item Number	ARARs or TBC Requirements	Regulatory Citation	Type	Relevancy[a]	Implementation of ARAR Description
8c	Management of Containers	IDAPA 58.01.05.008 (40 CFR 264.173)	Action	A	Containers being stored will be kept closed at all times, except when adding or removing waste. Vented containers are considered closed, if vents are installed per the manufacturer's recommendations. In general, all containers stored in the CERCLA storage areas are vented. Containers will be managed in such a way to prevent conditions that may rupture the container or cause it to leak. The following criteria apply only to wastes stored in a modified dense pack arrangement in the CERCLA SE: Quarterly inspections will be performed to verify that containers are positioned properly and properly located in the storage configuration. Rows of drums in the SE are no more than 4 drums wide by 5 drums high by 28 in length. Aisle spacing requirements will be maintained.
8d	Inspections	IDAPA 58.01.05.008 (40 CFR 264.174)	Action	A	At least weekly, inspections of the area where containers are stored will be performed. For additional information on inspections being performed, see items numbered 8a, 8c, 8e, 10, 12b, 12c, and 12e.

Table A-1. (continued).

Item Number	ARARs or TBC Requirements	Regulatory Citation	Type	Relevancy[a]	Implementation of ARAR Description
8e	Containment	IDAPA 58.01.05.008 (40 CFR 264.175)	Action	A	In general, containers with free liquid will not be stored in the CERCLA storage areas because free liquid is not expected to be encountered and retrieved from the pit. Additionally, if free liquids are retrieved and sent with waste to the waste processing drum packaging station, then it is expected that the free liquid will be observed during the visual examination and absorbed. If containerized free liquids are stored in the CERCLA storage areas, then portable secondary pallets/pans will be used for those containers that have the capacity to contain a minimum of 10% of the volume of the containers located on the spill pallet/pan. Containerized free liquids will not be stored outdoors in unenclosed areas. Monthly inspections of the spill pallets/pans will be performed, looking for evidence of significant cracks and gaps that may compromise the integrity of the containment. Weekly visual inspections will also be performed to verify that no liquid is present in the containment system of the spill pallet/pan.
8f	Special Requirements for Ignitable or Reactive Waste	IDAPA 58.01.05.008 (40 CFR 264.176)	Action	A	The facility boundary line is defined as the INEEL boundary. The RWMC is three miles from the southern INEEL boundary, which is the closest boundary to the RWMC. Therefore, the waste stored in the storage units is more than 15 m (50 ft) from the INEEL boundary.
8g	Special Requirements for Incompatible Wastes	IDAPA 58.01.05.008 (40 CFR 264.177)	Action	A	In general, incompatible wastes are not stored in the CERCLA storage areas. In the event that incompatible wastes are stored, then containers holding incompatible wastes will be separated via distance (i.e., located in separate rows) if the waste contains no free liquids. If the incompatible wastes contain free liquids, then the wastes will be segregated through use of separate spill pallets/pans.

Table A-1. (continued).

Item Number	ARARs or TBC Requirements	Regulatory Citation	Type	Relevancy[a]	Implementation of ARAR Description
9	General Waste Analysis	IDAPA 58.01.05.008 [40 CFR 264.13(a)(1) and (a)(2)]	Action	A	Chemical and physical characterization will be performed for Pit 4 waste, per a set sampling regime via the *WIPP/RCRA Field Sampling and Analysis Plan* (Arbon 2004), during retrieval of the waste and use of AK. AK will consist of information gathered from the generating facility and information from past retrieval activities (e.g., Glovebox Excavator Method, TSA, etc.) will also be used for waste generated from similar processes. Additional sampling and analysis will be performed, if required.
10	General Inspection Requirements	IDAPA 58.01.05.008 [40 CFR 264.15(a) and (c)]	Action	A	Inspections of the areas where containers are stored will be performed on items (e.g., malfunctions, deterioration) which may cause or lead to (1) releases of hazardous waste constituents to the environment or (2) a threat to human health. Following completion of all inspections, any identified problems requiring further action are corrected on a timely basis. For additional information on inspections being performed, see items numbered 8a, 8c, 8e, 10, 12b, 12c, and 12e.

Table A-1. (continued).

Item Number	ARARs or TBC Requirements	Regulatory Citation	Type	Relevancy[a]	Implementation of ARAR Description
11	General Requirements for Ignitable, Reactive, or Incompatible Waste	IDAPA 58.01.05.008 [40 CFR 264.17(a) and (b)]	Action	A	Open flames, cutting, welding, or other similar spark or ignition sources are not allowed within the CERCLA storage areas unless repair is required of a piece of equipment, in which case the equipment and the open flame or spark source are isolated to the extent feasible from the waste in storage. Additionally, smoking is not allowed inside of the CERCLA storage areas. Incompatible wastes, if are placed into the CERCLA storage areas, are segregated as discussed earlier. Routine inspections of the CERCLA storage areas provide regular assessment of storage conditions and early identification of potentially hazardous situations. Malfunctioning equipment is tagged and either locked out or isolated. Wastes are stored in containers that are kept closed at all times, except when adding or removing waste.
12	Preparedness and Prevention	IDAPA 58.01.05.008 (40 CFR 264, Subpart C)			(See items that follow.)
12a	Design and Operation of Facility	IDAPA 58.01.05.008 (40 CFR 264.31)	Action	A	The AR Project buildings are designed, constructed, maintained, and operated in such a manner as to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste constituents to the air, soil, or surface water which could threaten human health or the environment.

Table A-1. (continued).

Item Number	ARARs or TBC Requirements	Regulatory Citation	Type	Relevancy[a]	Implementation of ARAR Description
12b	Required Equipment	IDAPA 58.01.05.008 (40 CFR 264.32)	Action	A	Two-way radios will be used by personnel such that immediate emergency instructions may be given to all affected personnel. The two-way radios will also be used to summon emergency assistance from local police departments, fire departments, and/or State or local emergency response teams. A two-way radio will be worn by at least one person during all entries into the CERCLA storage areas. A minimum of four portable fire extinguishers will be present within the SE, one extinguisher located in the vicinity of each personnel access door. A monthly inspection will be performed to ensure that fire extinguishers are in the proper location, easily accessible, and that there is no evidence of damage or tampering. A minimum of one spill control equipment will be present in the SE. If only solid waste is being stored within the SE, then the spill control equipment will consist of a shovel, broom, plastic bag(s), and overpack container. If containerized free liquids are being stored, then an absorbent material will also be part of the spill control equipment in addition to the items required for solid waste storage. A monthly inspection will be performed to verify the presence of the spill control equipment and the contents of the equipment. Water at adequate volume and pressure is available for the AR Project buildings, via a fire hydrant, to supply water hose systems.
12c	Testing and Maintenance of Equipment	IDAPA 58.01.05.008 (40 CFR 264.33)	Action	A	All communication or alarm systems, fire protection equipment, spill control equipment, and decontamination equipment, where required, will be tested per a set schedule to assure its proper operation in the event of an emergency. Maintenance will be performed per manufacturer's recommendations, regulatory requirements, or based upon a reliability centered maintenance program.
12d	Access to Communications or Alarm Systems	IDAPA 58.01.05.008 (40 CFR 264.34)	Action	A	Whenever hazardous waste is being managed at the AR Project facilities, immediate access to an emergency communication device (e.g., two-way radio) will be available. See Item 12c for additional information on the use of two-way radios.

Table A-1. (continued).

Item Number	ARARs or TBC Requirements	Regulatory Citation	Type	Relevancy[a]	Implementation of ARAR Description
12e	Required Aisle Space	IDAPA 58.01.05.008 (40 CFR 264.35)	Action	A	A quarterly inspection will be performed in the SE to ensure that a minimum of 0.9-m (3-ft) aisle space is maintained between rows of containers and between the rows and all internal and external walls. Additionally, a minimum of 6.1 m (20 ft) will be maintained for the center access aisle. Alternate storage configuration may be required for special case waste storage, such as incompatible waste or waste with criticality considerations.
13	Miscellaneous Units	IDAPA 58.01.05.008 (40 CFR 264, Subpart X)	Action	A	Thermal treatment processes have been considered for the treatment of organic compounds in the waste. Currently, a treatment technology has not been chosen, but it is expected that substantive ARARs will be required in order to adequately implement the Subpart X–Miscellaneous Units requirements. Once a treatment technology has been chosen, Subpart X requirements will be revisited to determine the ARARs. Decisions regarding specific treatment technology will be made in conjunction with EPA, DEQ, and other stakeholders.
14	Land Disposal Restrictions – Treatment Standards	IDAPA 58.01.05.011 (40 CFR 268.40, 44, 45, 48, and 49)	Action	A	Waste disposed of at WIPP is not required to meet the LDR, given that WIPP has been granted a no migration variance. Waste profiles will be developed for any waste disposed of at other disposal facilities and will be treated to meet the appropriate treatment standards, as applicable. A site-specific risk-based treatability variance may be developed in conjunction with the design of a treatment system, as applicable.
15	Polychlorinated Biphenyls Storage and Disposal	40 CFR 761	Action	A	Inventory documentation indicates that PCBs were not a routine contaminant in Pit 4 waste streams, but may have been placed in Pit 4 waste occasionally. In the event that PCB contamination at 50 ppm or greater is generated, it may be stored in the SE in accordance with the risk-based storage approval documented in the AR Project Action Memorandum (DOE/NE-ID-11179).
16	Radioactive Waste Management	DOE Order 435.1	Action	TBC	The requirements of DOE Order 435.1 is implemented through the use of various management control procedures for the INEEL.

Table A-1. (continued).

Item Number	ARARs or TBC Requirements	Regulatory Citation	Type	Relevancy[a]	Implementation of ARAR Description
17	Radiation Protection of the Public and the Environment	DOE Order 5400.5	Action and Chemical	TBC	The requirements of DOE Order 5400.5 is implemented through the use of various management control procedures for the INEEL.

a. Relevancy refers to the type of requirement: A= applicable, RA= relevant and appropriate, or TBC = to-be-considered.
AR Project = Accelerated Retrieval Project
ARAR = applicable or relevant and appropriate requirement
CAP-88 = Clean Air Act Assessment Package, 1988
CERCLA = Comprehensive Environmental Resource, Compensation and Liability Act
CFR = Code of Federal Regulations
DOE = Department of Energy
EDE = effective dose equivalent
EPA = Environmental Protection Agency

Appendix B

Waste Acceptance Criteria for AR Project SE

Appendix B

Waste Acceptance Criteria for AR Project SE

WASTE ACCEPTANCE CRITERIA FOR ACCELERATED RETRIEVAL PROJECT WASTE

The following waste acceptance criteria (WAC) apply to waste generated from the Accelerated Retrieval (AR) Project to be stored in WMF-698, Storage Enclosure, located in the Subsurface Disposal Area at the Radioactive Waste Management Complex (RWMC) or in WMF-628 in the RWMC Transuranic Storage Area. These waste streams will include all waste retrieved from the AR Project, as well as secondary and DD&D wastes. Waste types that may be accepted include:

- TSCA regulated waste
- CERCLA waste
- Mixed transuranic (MTRU) waste
- Mixed low-level waste (MLLW)
- Transuranic waste (TRU)

Other waste types such as low-level waste, industrial waste, and hazardous waste may also be stored in the WMF-698, but will be managed in accordance with applicable sections of the Idaho National Engineering and Environmental Laboratory Waste Acceptance Criteria (DOE/ID-10381).

The purpose of this section is to define the requirements for accepting waste generated from the AR Project for storage in WMF-698 or WMF-628. These requirements are based on the RWMC HWMA/RCRA Part B Permit, DOE Orders, RWMC Safety basis, applicable Code of Federal Regulations, and offsite disposal facility waste acceptance criteria.

Wastes which do not meet the criteria in this section may be accepted by the facility manager for storage on a case-by-case basis following appropriate subject matter expert reviews and an evaluation of the waste and available information to ensure it meets the requirements of the facility authorization basis. Deviation from specific criteria (i.e., packaging criteria) requires DOE-ID approval in addition to facility manager approval.

Wastes that are generated from the AR Project will be managed as CERCLA waste. The waste will be considered newly generated waste, and the generator must comply with the applicable waste acceptance criteria for disposal for any newly generated waste. While in WMF-698 CERCLA storage , the waste acceptance criteria will apply in addition to the project-specific CERCLA Applicable or Relevant and Appropriate Requirements (ARARs). While in WMF-628, the waste acceptance criteria will apply in addition to the requirements of the HWMA/RCRA permit for WMF-628.

DOCUMENTATION REQUIREMENTS

1. All wastes will be characterized and have appropriate hazardous waste codes identified (e.g., through process knowledge and/or sampling) before they are accepted for storage in WMF-698 or WMF-628.

2. TRU waste with no identified path to disposal must be generated only in accordance with DOE Guide 435.1-1, Chapter III, H(2), and is managed on a case-by-case basis as approved by the facility manager.

3. A completed Integrated Waste Tracking System (IWTS) Material and Container Profile are required for storage in WMF-698 and WMF-628.

4. For TRU and mixed TRU waste, documentation must be entered into the the Container Comments Screen of IWTS that the waste is defense related and the waste is generated from "Defense nuclear waste and materials by-products management."

CONTAINER PROPERTIES

1. All containers stored in WMF-698 and WMF-628 shall meet U.S. Department of Transportation (DOT) Specification 7A, Type A, packaging requirements. Wastes stored in WMF-628 may also be stored in accordance with packaging criteria of the HWMA/RCRA storage permit for WMF-628, Attachment 1, Section D 1b(2)(1), pending facility manager approval.

2. Waste containers must be visually verified to be in good condition (e.g., no severe rusting, apparent structural defects) or free of leaks prior to being accepted into storage. If the container does not meet these criteria, the owner or operator must transfer the waste from this container to a container that is in good condition and meets the proper shipping requirements for this waste type, or manage the waste in some other way that complies with the requirements of 40 CFR 264 Subpart I.

3. The following containers are acceptable for storage in WMF-698:

   a. 55-gallon drums

   b. 85-gallon drums

   c. Standard Waste Boxes

   Containers acceptable for storage in WMF-628 are identified in the HWMA/RCRA storage permit for WMF-628, Attachment 1, Section D 1b(2)(1).

4. Each container shall comply with the weight limits shown in Table B-1. Calibration of the scales used to make these weight determinations shall be in accordance with the National Institute of Standards and Technology (NIST) Handbook 44 or an equivalent standard.

Table B-1 Weight Limits.

Container	**Maximum Gross Weight (lbs)**
55-gallon drum	≤ 1,000
85-gallon drum containing one 55-gallon drum	≤ 1,000
SWB	≤ 4,000

5. Removable surface contamination on CH-TRU waste containers shall not exceed 20 dpm/100 cm^2 alpha and 1000 dpm/100 cm^2 beta-gamma.

6. Each container shall be labeled with a unique container identification number using bar code labels permanently attached in conspicuous locations. The container identification number shall be in medium to low density Code 39 bar code symbology as required by American National Standards Institute (ANSI) Standard ANSI/AIM BC1-1995 in characters at least 2.54 cm (one in.) high and alphanumeric characters at least 1.27 cm (one-half in.) high. In the case of 55- and 85-gallon

drums, the minimum of three bar code identification labels shall be placed at approximately equal intervals around the circumference of the drum (120 degrees for 3 labels, 90 degrees for 4 labels, etc.). In the case of SWBs, bar code labels are required on the flat sides of the SWBs.

7. Containers shall be marked "Caution Radioactive Material" using a yellow and magenta label as specified in 10 CFR 835.

8. Each container shall have one or more filter vents. These filter vents shall meet the specifications of the TRAMPAC and CH-TRAMPAC, as applicable.

9. Label all containers containing CERCLA-generated waste with the words "CERCLA WASTE" and with appropriate HWNs. For storage in WMF-628, also label all containers of mixed waste with the words "HAZARDOUS WASTE".

10. For each container of CERCLA-generated waste, provide a description of the waste, including a list of contaminants of potential concern, known Environmental Protection Agency (EPA) waste numbers, operable unit, name and phone number of the generator point of the container, and a container description.

11. Clearly mark all containers located in WMF-698 or WMF-628 with a waste generation date (date the waste was removed or excavated or removed from service) that is visible for inspection.

12. Containers must be sealed with a tamper-indicating device (TID), which is to be installed on each container by the generator.

13. Mark each PCB container with the large PCB M_L or M_S mark.

14. Mark PCB items with the date the item was removed from service for disposal.

CONTAINER CONTENTS

1. 55- and 85-gallon drums shall contain ≤ 380 Pu-239 fissile gram equivalents (FGE) and meet the TRU waste fissile material concentration limits listed in Table B-2. SWBs shall contain ≤ 380 FGE.

Table B-2. TRU waste fissile material concentration limits.

Waste Matrix Group	Polyethylene	Cellulose	Metal (Al)[a]	Concrete	Brick	Glass/Slag	Graphite	Salt
TVC[b,c] Pu-239 g/lb	3.10	1.30	0.82	0.38	0.23	0.09	0.02	5.53
Pu-239 g/kg	6.82	2.86	1.8	0.84	0.51	0.020	0.04	12.17
U-233 g/lb	4.98	2.16	0.38	0.62	0.34	0.15	0.03	4.27
U-233 g/kg	11.0	4.75	0.84	1.36	0.75	0.33	0.07	9.39

a. To be conservative, the threshold value for metal was calculated using aluminum
b. Threshold value concentration
c. For all fissile radioisotopes except U-233

2. The total residual liquid in any container shall not exceed 1 percent by volume of that container.

3. Containers shall be verified to be free of sealed containers greater than 4 liters.

4. Pyrophoric radioactive materials shall be present only in small residual amounts (< 1 percent by weight) in containers and shall be generally dispersed.

5. Waste exhibiting the characteristic of reactivity (EPA HWND003) is not acceptable.

6. Waste containing incompatible materials or materials incompatible with container and packaging materials is not acceptable.

7. Waste shall contain no explosive, corrosive, or compressed gases (pressurized containers).

8. Active pathogens, infectious substances, and etiological agents may not be accepted unless they have been rendered nonhazardous by disinfecting or sterilization.

Appendix C

Secondary Waste Stream Summary for the AR Project

Appendix C

Waste Stream Summary for the AR Project

Table C-1 contains a list of the waste estimated to be generated during the AR Project, including construction, operation, and interim closure.

Table C-1. Waste stream summary for the AR Project.

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
Construction Phase					
Construction debris—metals.	Not estimated (NE)	Material or item can be recycled or reused (N/A).	IW	Temporarily staged near Pit 4.	Recycling or INEEL Landfill Complex.
Construction debris—(other) wood, plastics, and paper.	NE	N/A	IW	Construction debris dumpster.	Recycling or INEEL Landfill Complex.
Radiological control survey waste.	<7 ft^3	One 55-gal drum	LLW—No contamination expected; however, radiological control survey waste is managed as LLW.	Stored in survey waste cargo container at the TSA.	RWMC LLW pit.
Operations Phase – Waste from inside the RE or drum packaging stations.					
Waste zone material, including: 741 Sludge 742 Sludge 743 Sludge Media Uranium Roaster Oxides Graphite.	2600 m^3	12,500 55-gal drums of waste zone material	Mixed transuranic (MTRU) waste Mixed Low-Level Waste	Interim storage at WMF-698.	Ultimate disposal at the Waste Isolation Pilot Plant (WIPP). Treatment at Material and Energy Corporation (M&EC), with ultimate disposal at Envirocare of Utah.
PPE from waste zone material retrieval (to include PPE from maintenance, operations, etc.).	100 m^3	Roll-off containers or laundry containers	LLW MLLW Reuse	Interim storage outside of Pit 4 Retrieval Structure. Some of the PPE, including respirators, may be sent to radiological laundry for cleaning and reuse.	Ultimate disposal at the Idaho CERLA Disposal Facility (ICDF). Radiological laundry for washing.
Used parts and equipment to be discarded (i.e., handtools).	<7 ft^3	One 55-gal drum	MTRU	Interim storage at WMF-698.	Ultimate disposal at WIPP.

Table C-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
Decontamination waste supporting maintenance (liquid waste generation will be avoided).	180 ft^3	Container type has not been identified; however, would result in 25 55-gal drums.	MTRU	Will be placed in waste stream.	Ultimate disposal at WIPP.
Radiological control survey waste.	20 ft^3	Roll-off container	MLLW	Interim storage outside of Pit 4 Retrieval Structure.	Ultimate disposal at ICDF.
Spill waste—hydraulic fluids (includes hydraulic fluids that leak from the excavator/fork lift inside the Retrieval Structure).	NE	NE	MTRU, will be absorbed and will be part of the waste zone material.	NA	NA
Used high-efficiency particulate air (HEPA) or roughing filters.	100 ft^3	20 55-gal drums	MTRU	Interim storage at WMF-698.	Ultimate disposal at WIPP.
Operations Phase – Waste from outside the RE or drum packaging stations					
PPE waste from maintenance and operations (e.g., cotton gloves).	20 ft^3	Three 55-gal drums	IW	Clean waste receptacles.	INEEL Landfill Complex after survey release.
Used parts from maintenance.	20 ft^3	Three 55-gal drums	IW	Clean waste receptacles.	INEEL Landfill Complex after survey release.
Administrative waste (paper, tape, pens).	30 ft^3	Four 55-gal drums	IW	Clean waste receptacles.	INEEL Landfill Complex after survey release.
Spill waste—hazardous materials.	NE	NE	HW	RWMC CERCLA storage.	INEEL contract for HW disposal.
Spill waste—nonhazardous materials (i.e., forklift hydraulic fluids).	NE	NE	IW	RWMC CERCLA storage.	INEEL Landfill Complex after survey release.
Radiological control survey waste.	<7 ft^3	One 55-gal drum	No contamination expected; however, radiological control survey waste is managed as LLW.	Stored in survey waste cargo container at TSA.	RWMC LLW pit.

Table C-1. (continued).

Waste Stream Description	Estimated Volume	Container Type and Quantity	Expected Type(s)[a]	Storage or Staging Location	Planned Disposition
Light bulbs.	NE	NE	IW or universal waste (UW).	Clean waste receptacles or RWMC accumulation area for UW bulbs.	INEEL Landfill Complex or INEEL contract for UW disposal.
Batteries.	NE	NE	IW or UW	Clean waste receptacles or RWMC accumulation area for batteries if UW.	INEEL Landfill Complex or INEEL contract for UW disposal.
			Shutdown Phase		
PPE waste from decontamination.	200 ft^3	Roll-off container	MLLW Reuse	Interim storage outside of Pit 4 Retrieval Structure. Some of the PPE, including respirators, may be sent to radiological laundry for cleaning and reuse.	Ultimate disposal at the ICDF. Radiological laundry for washing.
Tools and Equipment.	20 ft^3	Three 55-gal drums	MTRU Reuse	Interim storage at WMF-628 or CERCLA storage area. Material may be reused for next retrieval.	Ultimate disposal at WIPP. Reuse.
Compressed gas cylinders.	N/A	N/A	N/A	Staged in area of contamination.	CFA Property Control (Contract for compressed gas cylinders).
Radiological control survey waste.	20 ft^3	Roll-off container	MLLW	Interim storage outside of Pit 4 Retrieval Structure.	Ultimate disposal at the ICDF.

Appendix D

Inspection Checklist

Appendix D

Inspection Checklist

Criteria [a]	Status			Comments
	S	U	N	
Weekly				
Leaks/Spills: Visually inspect the SE to ensure there are no visible signs of leaks or spills. If liquids, or other potential hazardous or mixed wastes are found on a container, pallet, or on the floor then initiate corrective action.				
Leaks/Spills: Visually inspect the other CERCLA storage areas to ensure there are no visible signs of leaks or spills. If liquids (other than precipitation) or other potential hazardous or mixed wastes are found on a container, pallet, or on the floor, then initiate corrective action.				
Secondary Containment: Visually inspect the SE to verify that no liquid is present in the containment system of the spill pallet/pan.				
Secondary Containment: Visually inspect the other CERCLA storage areas to verify that no liquid is present in the containment system of the spill pallet/pan.				
Radiological survey: Collect a swipe from any spill/leak or from any container observed with damage that could impact container integrity.				
Monthly Inspections				
Secondary Containment: Inspect spill pallets/pans in the SE looking for evidence of significant cracks and gaps that may compromise the integrity of the containment.				
Secondary Containment: Inspect spill pallets/pans in the other CERCLA storage areas looking for evidence of significant cracks and gaps that may compromise the integrity of the containment. This inspection will be performed around the perimeter of the container rows and down the central aisle.				
Fire Extinguishers: Visually fire extinguishers to ensure they are in the proper location, easily accessible, and that there is no evidence of damage or tampering.				
Spill Control: Visually inspect spill control equipment and the contents of the equipment.				

Criteria [a]	Status			Comments
	S	U	N	
Quarterly Inspection				
Leaks/Spills: Visually inspect the SE for any liquid present on or near the containers and for signs of defective, visibly pitted, metal fatigued, or deteriorated containers. This inspection will be performed around the perimeter of the container rows and through each aisle in between the rows of containers.				
Radiological survey: Collect a swipe from any spill/leak or from any container observed with damage that could impact container integrity.				
Storage Configuration: Verify that containers in the SE are positioned properly and properly located in the storage configuration. Rows of drums in the SE are no more than 4 drums wide by 5 drums high by 28 in length.				

a. Containment inspection requirements are included as a contingency action in the event that free liquids require storage in spill pallets/other containment.
S = Satisfactory
U = Unsatisfactory
N = Not Applicable